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MONOGRAPHS

Pages
13. PHOTOGRAPHING FLOWERS AND TREES 1– 34
14. STREET PHOTOGRAPHY 49– 88
15. INTENSIFICATION AND REDUCTION 101–126
16. BROMIDE PRINTING AND ENLARGING 139–171
17. THE CARBON PROCESS 185–222
18. CHEMICAL NOTIONS FOR PHOTOGRAPHERS . . . 237–266
19. PHOTOGRAPHING CHILDREN 281–304
20. TRIMMING, MOUNTING AND FRAMING 315–344
21. ALBUMEN AND PLAIN PAPER PRINTING 357–386
22. GUM-BICHROMATE PRINTING 399–419
23. PHOTOGRAPHIC MANIPULATIONS 433–471
24. PHOTOGRAPHING CLOUDS 485–512

ILLUSTRATORS

Facing or following page
Abbott, C. Yarnall 116
Abel, Juan C. 253
Baker, F. C. 154, 167, 327
Beasley, H. A. 289
Beeby, John 49, 53, 64, 65, 76
Bement, Frank 212
Bland, W. R. 139
Carpenter, S. I. 492
Cassard, W. J. 4, 24, 124
Clow, W. S. 106
Core, E. B. 284
Davison, E. J. 117

Ingraham Fund

	Facing or following page
Day, F. Holland	342
Dent, J. M.	300
Dovaston, Freeman	52
Dyer, W. B.	399
Firmin, George D.	101
Gill, William	288
Hall, Henry	245
Hewitt, Arthur	364, 365, 372, 380, 381
Holden, Alfred	125, 342
Hollinger, W. M.	285
Hoyt, Dudley	244
Ingram, W. H.	159
Inston, Chas. F.	60, 197
Käsebier, Gertrude	401
Kemp, John H.	300
Knouse, Harry C.	330
Lippincott, Oliver	193
Luitweiler, C. S.	499, 501, 503
McCorkle, J. H.	185, 192, 485
McFarland, J. Horace	5, 8, 9, 12, 13, 24, 25, 296, 304, 316, 331, 339
McLiesh, Wm.	238
Meeker, George C.	166
Metcalf, William C.	24
Nicholson, J. Whitall	155, 158
Pach Bros.	260
Partridge, W. H.	284
Perret, Frank A.	418
Pierce, Henry H.	252, 301, 357, 373
Redfield, Robert S.	326
Royle, Vernon	440, 441, 460, 461
Selby, Misses	297
Spellman, D. D.	104, 261
Spencer, Ema	105
Sutcliffe, Frank M.	77
Stephany, Lewis F.	213
Tingley, George E.	281, 433, 444, 445
Troth, Henry	1, 8
Ward, Catharine Weed Barnes	61, 304
Waugh, F. A.	338, 402, 404, 411, 414
Woolfall, G. H.	32, 33
Yellott, Osborne I.	84, 85, 485, 489, 492

INDEX

Acid fixing-bath, 103.

Albumen printing — Historical notes, 359; varieties of paper, 361; the silver bath, 362, 364; argentometer, 363; sensitizing, 364; fuming, 366; storing sensitized paper, 367; printing, 368; toning preliminaries, 369; stock gold solution, 370; uranium-soda, acetate-gold, phosphate, borax and tungstate toning baths, 371; washing before toning, 371; toning and fixing, 372; testing prints for hypo, 373; saving paper wastes, 373.

Ammonium persulphate, 84, 90, 117, 123, 133, 309.

Apochromatic *Collinears*, 425.

Applications of photography, 422.

Backing plates, 27, 57.

Bibliography, 227.

Bromide printing and enlarging — Bromide paper described, 139; uses and advantages, 140; varieties, 141; choice, 142. *Contact printing:* Negatives for, 142; illumination, 143; sensitiveness of bromide paper, 146; printing distance, 146; developers, 147; exposure, 148; proofs from wet negatives, 149; fixing and washing, 150; dodges in printing, 150; paper negatives, 151 (read "ten times" for "one-twentieth" here). *Enlargements:* Choice of illuminants, 151; day-light, 152; apparatus needed, 153; enlarging room, 152; enlarging from films, 156; enlarged negatives, 157; enlarging with artificial light, various illuminants, 157; the light box, 157; condensers, 158; mounting condensers, 159; tables of enlargement, 160; focusing, 161; exposures, 161; dodging and vignetting, 163; composite printing, 164; use of bolting cloth, 165; aftertreatment in enlarging, 165; reduction and intensification, 166; toning by various methods, 167; trimming and mounting, 170. *Books*, 171.

Bromo-hydrochinon developer, 11.

Carbon printing — Advantages, 185; process described, 186; origin and evolution, 187; principles, 190; effect of light action, 190; "tissues," 192; transfer paper, 192; various supports, 193; tools needed, 193; storing tissue, 194, 201; sensitizing solution, 195; modifications, 197; sensitizing, 198; bichromate poisoning, 199; drying tissue, 199; exposure, 202; actinometers, 203; safe edge, 204; dampness, 205; latitude in printing, 205; continuing action of light, 205; single transfer, 206; double transfer, 207; transferring to paper, 208; to rigid supports, 209; development, 209; under- and over-exposure, 210; control in development, 211; clearing, 212; flexible support for double transfer, 212; rigid temporary supports, 213; final supports, 213; various supports, 214; a modified carbon method, 215; carbon transparencies, 216; lantern slides, 217; toning and intensifying, 217; printing in skies, 219; retouching and spotting, 219; finishing, 220.

Chemistry of photography, 237; the elements, 238; weighing in, 239; symbols and equivalence, 240; atomic theory, 240; chemical compounds, 241; equations, 242; appliances, 242; chloride of silver, 244; action of light on, 246; chemical sensitizers, 247; restrainers and desensitizers, 247; photo-chemical action, 248; equivalent solutions and their use, 248; a printing-out emulsion, 249; emulsion for development, 250; chemistry of development, 250; developing agents, 251; restrainers, 252; defects of pyro-ammonia, 253; sulphites and their use, 253; caustic alkalies and carbonates, 254; preservatives in developers, 254; chemistry of fixing, 255; physical development, 256; chemistry of intensifying and toning, 257; platinum printing, 258. *Books* on photo-chemistry, 260. Table of elements, 261; of chemical formulæ and equivalence, 263. Facts to know: Solubilities, 434; chemicals which spoil, 435; sulphites, 435; alkalies, caustic and carbonated, 436; acids, 437; potassium salts, 438; hypo, 438; water, 439; powdering and dissolving chemicals, 447.

Children, Photographing—A new art, 282; the first lesson, 282; child love, 283; making friends, 284; environment, 285; camera, 286; lenses, 287; tripod and plates, 288; backgrounds and illumination, 289; single figures, 290; babies, 291; the smile, 292; groups, 292; toys, 293; posing, 294; multiple pictures, 294; flashlights, 296. *Children out-of-doors:* Some subjects, 298; exposures, 298; backgrounds, 299; mistakes and remedies, 300. *Studio work:* Preparations, 301; babies, 302; groups, 303.

Clouds, Photographing—Argument, 485; chief methods in use, 486; other methods, 488; by variation of exposure, 488; various exposure shutters, 488; halation and its cure, 489; backed plates, 490; illumination, 490; solar spectrum, 491; corrected plates needed, 492; the color screen, 492; testing the screen, 494; clouds on ordinary plates, 496; screen and corrected plates adjusted, 498; how the screen helps, 499; exposure, 499; development, 500; local development, 501; cloud forms, 502; sunset and moonlight effects, 503; cloud negatives for printing-in, 504; method of printing-in, 506; masking and other wrinkles, 507; printing frames, 508; printing operations, 508; copied negatives, 509; defective skies, 510; improving negatives, 510.

Collinears, 93, 425.

Composition, 58–64.

Conventions—National, 224; New England, 278; Iowa, 480.

Developers—Bromo-hydrochinon, 11; eiko-hydro, 11; pyro-soda, 36 (substitute sulphurous for sulphuric in this formula), 43.

Distances, Salomon's table of, 75.

Electric light portraiture, 179.

Emerson, Dr. P. H., 40, 177.

Enlargement, tables facilitating, 160.

Enlarging (See Bromide printing).

Exposure shutters, 54, —.

Exposure system—Yellott's, 65–82; in pinhole work, 182.

Films—Keeping qualities, 43; enlarging from, 156; drying roll films, 469.

Flowers, Photographing—*Compositions indoors:* apparatus needed, 2; plates, 3; ray-filter, 3, 12; illumination in general, 4; backgrounds, 4; preparing the flowers, 5; arrangement and focusing, 6; lighting, 7; exposure, 8, 12; practical experience, 9; developers and development, 10. *Flowers, life size:* Modification of apparatus, 12; a stand for vertical photography, 14; avoiding reflections, 17; a focusing device, 17, 19; temperature, 18; lighting, 20; exposure, 21; development, 22; photographing flowers pendent, 23; special lines of work, 24. *Flowers in their natural haunts:* tripods, 25; camera and lens, 26; backing plates, 27; use of ray-filter, 27; weather, 28; illumination, 28; wind, 29; practical work, 30; reproducing nature's colors, 33.

Focusing—Flowers, 6, 17; street scenes, 56; in enlarging, 161; in photographing children, 286; for multiple pictures, 295; for flashlight portraits, 297; dark interiors, 174, 429.

Fog in negatives, 104.

Formalin, 175, 389.

Fox Talbot, 181.

Framing photographs—Argument, 332; black and white prints, 333; close framing, 334; wooden and oval frames, 335; the passepartout, 335–337; cloth-covered frames and their making, 337–344; various examples of framing, 344.

Gum-bichromate printing—Argument, 399; the gum print defined, 400; its virtues, 401–403; suitable subjects, 403; how to begin, 405; choice of paper, 407; sizing and colloids, 408, 409; the bichromates, 409; pigments, 410; brushes and other tools, 411; coating the paper, 411–413; drying, 413; (an alternative process, 413–415); printing, 415; developments, 416; fixing, 417; finishing, 418; historical sketch, 419. *Books* on the process, 419.

Intensification—Argument, 101; preparations for, 103; *methods:* mercurial, with ammonia, 105; ammonium sulphide, 106; sodium sulphite, 107, 108; ferrous oxalate, 109; by redevelopment, 84; with hydro-quinone, 109; with metol, 110; with gallic acid, 111; mer-

curic-iodide method, 111; with potassio-cyanide of silver, 113; agfa, 113; with mercury and platinum, 114; Wellington's silver method, 114; Balagny's alternative method, 115; with copper, 115; ferricyanide and uranium, 115; lead, 116; ammonium persulphate, 117. Comparison of methods, 117; local intensification, 118; with uranium, 119; the final washing, 120. *Books* on intensification, 126. Intensification of bromide prints, 166-169; of carbon transparencies, 217; of cloud negatives, 511.
Interiors, focusing dark, 174, 429.
Ives Kromskop system, 33.

Japan, photography in, 172.
Jena glass works, 177.

Lamplight photography, 37.
Lens-making for amateurs, 308.
Light, photographing against the, 426.

Magnalium for lens mounts, 43.
McLiesh, Wm., 276.
Metric system, 443.
Mitchell's Intensifier, 107.
Mounting Prints—Principles, 323; contrast or harmony, 323; mounting surfaces, 325; double mounting, 325; wide margins, 326; panoramic mounting, 326; contrast treatment, 327; placing the print, 328; proportions, 329; mountants, 330; practical details, 330; prepared and decorated mounts, 331; cut-out mounts, 332; mounting without cockling, 346.
Moving objects photographing, 78-81.

New England Convention, 278.
Night photography outdoors, 87.

Ownership of negative, 38.
Ozotype printing, 220-222.

Paris exhibition, photography at the, 38, 94, 135, 177, 306, 314.
Phosphate P. O. P., 43, 91.
Photographic manipulations—Weighing and measuring, 439; use of hydrometer, 441; measuring solids, 442; by parts, 442; use of metric system, 443-446; making solutions, 447; powdering chemicals, 447; dissolving solids, 448; measuring without measures, 450; filtering and filter papers, 451; making up developers, toning baths, etc., 453; labels and labeling, 456; cleaning bottles, 457; measuring quickly or in the dark, 458; cleaning dishes, 459; heating and cooling solutions, 460; rocking solutions, 461; washing plates and prints, 461-466; drying negatives and prints, 466-468; drying roll films, 469. *Books* of reference, 471.
Pinhole exposures, 182.
Plain paper printing—Varieties of paper, 374; sizing and salting, 375; arrowroot, gelatine, agar-agar, arrowroot and gelatine, gum arabic and resin papers, 376-378; Valenta's resin emulsion paper, 378; sensitizing solutions for various papers, 379; sensitizing, 380; printing, 380; gold and platinum toning, 381, 383; double toning, 382; the ammonio-nitrate process, 382; toning with copper, 383; Clemons' paper, 384; aluminum toning, 384; fixing plain paper prints, 385. *Books* on the processes, 386.
Plate speeds, 72, 180.
Platinum prints, clearing, 89, 230; platinum toning, 258, 383.
Positive films, 176.
Printing in the sun, 229.
Pyrol, 232.

Reduction of negatives, 120; Farmer's method, 121; with ferric-chloride, 122; Belitzski's formula, 122; with ammonium persulphate, 84, 123; with cerium, 124; with potassium permanganate, 125; with copper, 126. Local reduction, 121, 126; by friction, 126. *Books* on reduction, 126. Reduction of bromide prints, 166; of cloud negatives, 511.
Retouching, chemical, 234.
Röntgen, Professor, 40.

San Francisco Salon, 305, 393, 520.
Salon, Third Philadelphia, 515.
Snow scenes, 85.
Solar eclipse of 1900, 42, 132.
Speed of moving objects, 81.
Stains on negatives, 104.
Stigmat, *Gray's Double*, 349.
Stomach, photographing interior of, 391.
Street Photography — Pictorial material, 50; apparatus, 51; lenses, 53; exposure shutters, 54; focal length and perspective, 55; view finders, 55; plates, 56; study-

ing street pictures, 58; the value of simplicity, 60; composition, 61; point of view, point of interest, 62; vertical lines, 62; angularity of forms, 63; foreground, 64; exposure-stops, various factors, 64–69; light intensity, 69; table of exposures, 71; plate speeds, 72; shadows, 73; the stop to use, 74; table of distances, 75; time of day, 75; camera drill, 76; holding the camera, 77; moving objects, 78; table of distances of moving objects and size of picture image, 80; speed of movement in streets, 81; development, 82; intensification, 83; reduction, 84; enlarging street views, 85; snow scenes, 85; wet day photography, 86; buildings, 86; working at night, 87; *Books* on street photography, 88.
Sulphite of soda, 176, 253, 435, 483.

Tennant and Ward partnership, 345.
Trees, photographing—A promising field, 31; decorative natural forms, 31; wind, 32; exposure, 32; blossoms and berries, 33; reproducing the colors of nature, 33.
Trimming prints—Argument, 315-317; practical experiments, 317; selecting points of interest, 318; ovals, circles, 319; squaring prints, 319; tools for trimming, 320; the use of masks for trimming, 321; the white line method, 322. Trimming enlargements, 370.
Tripod walking stick, 395.

Unar lens, 41.
Universal developer, 11.
Uranium toning and intensifying, 115, 119, 169.

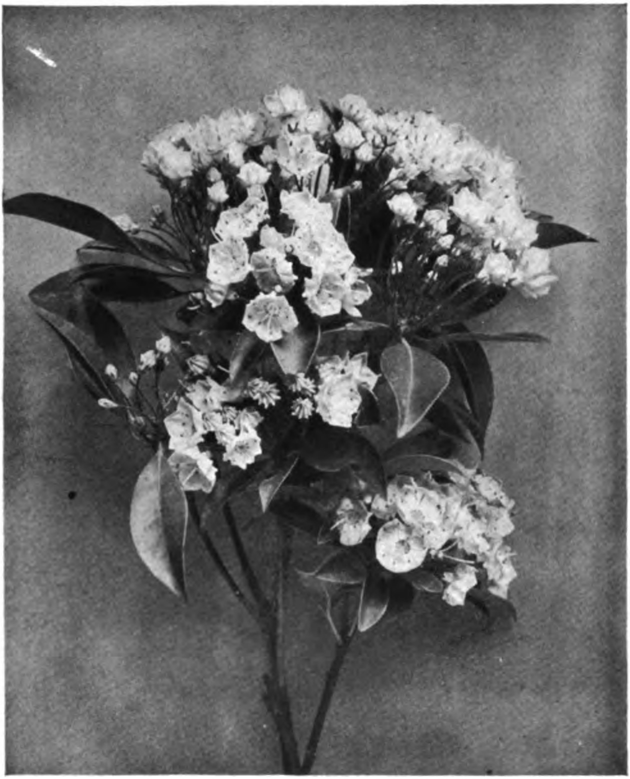
Vertical photographing, stand for, 14–16.
Voigtlander's new portrait lens, 43, 390.

Washing negatives, roll films and prints, 461–471.
Werner's Mezzotint carbon, 347.
Wet day photography, 86.

Yellott's exposure system, 65–82.

Zeiss anastigmats, 3, 41.
Zero-photography, Nipher's, 431.

6-58



MOUNTAIN LAUREL (*Kalmia latifolia*)
Henry Troth

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A Magazine of Photographic Information

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PHOTOGRAPHING FLOWERS AND TREES.

What more interesting and fascinating branch of photography can we discuss than that which relates to the preservation, in enduring form, of a record of Nature's jewels of bloom, bud and leaf! The flowers of the field attract us, in their native environments; the gems of the greenhouse and garden also afford most beautiful and available material for photography. There is the advantage of a great diversity of form, with every possible grace in shape and habit; there is the whole gamut of color to be considered, from purest white to deepest reds, blues and purples, from delicate creamy hues to flaunting orange, with all the intermediates of azure, pink and yellow. And the foliage also presents much of interest in the almost infinite variety of its greens, bronzes and browns.

Every resource of the advanced plate-maker in orthochromatism is needed; every trick of exposure and development may be fully employed. While the subjects are perhaps more facile than the human beings upon which ninety per cent. of all plates are exposed, they are by no means immobile or unchanging, and there is need to bring to this work all one's knowledge of light-action, all one's experience in handling shadows.

Considered as a means of artistic expression, flowers offer many advantages. The rarity of the specimens used is of no special importance, and often the commonest roadside bloom affords material for the best work.

Let me emphasize one point at the outset, even though it is a point that is of marked importance in any part of photography. It is that to succeed in depicting by the lens and camera the forms and at least the "color values" of flowers in a manner that shall be satisfactory and expressive, the operator must love the flowers. Treat them as material only, with no more tenderness than is shown to the inanimate cloth used for draping a model, and you will never catch the subtleties of beauty that are reserved for those who are moved to the work by the charms of leaf, bloom and fragrance.

Not the least of the advantages of flower-photography, pursued with the aforesaid love, is the insight it gives one into the mysteries and the elegancies of Mother Nature, and the acquaintance it fosters with the plants and trees of one's immediate neighborhood. A vast enlargement of one's horizon follows a summer's work in the field and meadow, in the glen and forest, and the portraying of the beauty of the coddled pets of the florist during the winter only whets the enjoyment of the first trip into the open flower land of Spring!

But, rhapsodizing aside, let us address the details of the subject, which quite naturally divides itself into four main branches: (1) the treatment of flowers in various compositions indoors; (2) their depiction in full size from individual specimens; (3) their photography outdoors, where they grow; and (4) the photographing of trees.

Flower Compositions Indoors.

Discussing first, because it is easiest and most practiced, the photography of flowers in various compositions indoors, we inquire at the outset as to the apparatus required for the work.

The photographing of flowers for pleasure does not require special or expensive apparatus. We may use the camera we already possess, whether it be a hand or stand camera, provided that the lens is of reasonable rapidity. The size of the picture-image, compared with the original, will depend on the focal length of the lens, which, in turn, has a definite relation to the length of the bellows extension. The bellows supplied with the average camera does not permit a picture-image more than one-fourth natural size; by means of supplementary lenses, such as the *Ideal*, or Nehring's *Ampliscope No. 1*, an enlarged image may be obtained. For systematic work, however, the familiar 5 x 7 camera is suggested as a happy medium for all branches of flower and tree photography, and a "long focus" folding box, with bellows extension of 18 or 20 inches, will meet all requirements. It should be fitted with a reversible back, single swing (enough for any camera!), and rising and horizontally shifting front.

The lens question is one of much importance. Contrary to what seemed right, and certainly contrary to the suggestions of lens-makers of good intentions and reputations, I have found that a medium wide-angle lens is by far the most generally serviceable for all parts of flower photography, outdoors and indoors. The reason is largely concerned with the greater depth of focus available at a given opening, and there are other advantages which will appear as the subject develops. A *Zeiss Series IV*, a *Morrison Wide-Angle*—any good lens of not over 6½ or 7 inches focus for a 5 x 7 plate—will do good service. Of course there are special conditions which will require the use of a lens of longer focus; and if the wide-angle lens selected is either symmetrical or "convertible," one of its elements will sometimes prove very serviceable. One thing is worth attention in choosing a lens for flower photography. Get one with an iris diaphragm, in which the diaphragm opens up to the full diameter of the lens. This is of great service in focusing, enabling the correct focus to be obtained far more quickly and avoiding the eye-strain which will be felt if one has to grope around on the ground-glass for an image focused indoors at *f*/12 or smaller.

Any good tripod will do, of course, but for indoor work some form of camera stand which can be readily shifted in a horizontal plane is far more serviceable than any tripod. Visions of vexation cross the writer's mind when he remembers the many times he has kicked his tripod out of a laboriously obtained position while preparing for exposure on fast wilting flowers! A regular studio camera stand is excellent for indoor work, or a stand may be improvised with boxes and a small table, the camera taking its place on top, unfastened. The special form of camera stand and exposing frame combined, described on page 14, is superior for this work, and the earnest operator will probably provide himself with this stand or some equivalent apparatus.

Plates.

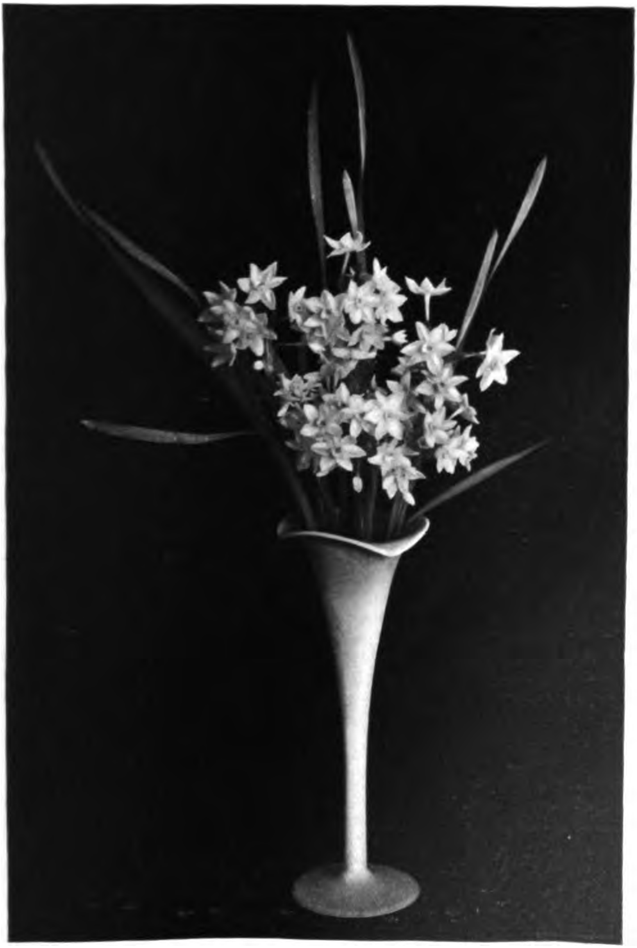
Orthochromatic plates are far better for flower photography than plain plates, because most flowers have some shades of yellow, and all green foliage is better rendered with them. A ray-filter is *not* an advantage save for deep orange and for blue shades, for with the best rapid isochromatic plates, in themselves quite sensitive to yellow and slightly repellant to blue, the additional restraint of even a much diluted bichromate cell will over emphasize the yellow shades, giving even a bright canary the same density on the plate as pure white. If blue flowers are to be pictured, however, the ray-filter becomes essential. A glass cell, filled with a 1 per cent. solution of potassium bichromate, 10 parts to 1,000 parts, will be found satisfactory. The ray-filter sent out by the Bausch & Lomb Optical Co. is now filled with this standard solution.

For indoor work, a rapid plate is desirable, because when the relatively faint light is considered in connection with the small stop often necessary to secure proper depth of focus, the exposure is prolonged to minutes, and a slow plate gives far too much chance for the flowers to sink down, wilt or shake, and it also puts an unreasonable strain upon the patience of the photographer. The *Cramer Instantaneous Isochromatic* plate is found very satisfactory for this work. In England the *Edwards* or *Cadett's Spectrum* plates are equivalent.

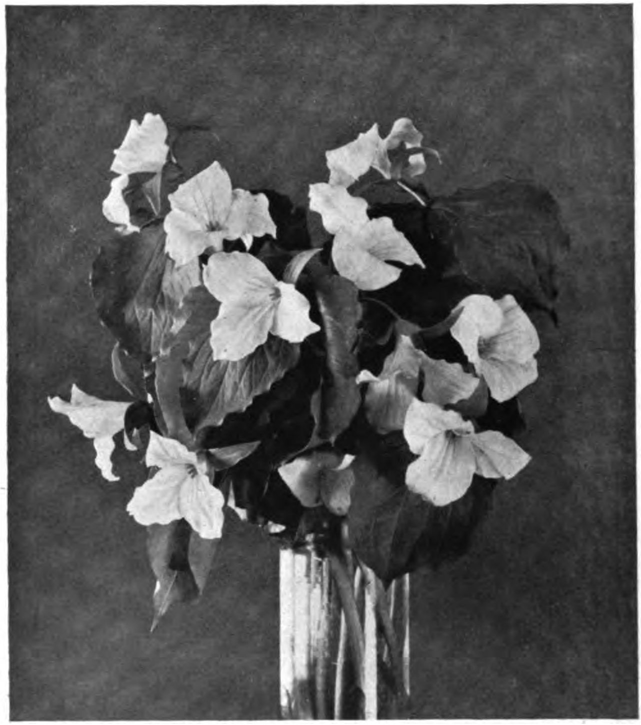
Illumination. The location for the indoor work is important. To begin with, a skylight is not required; it is even a disadvantage. A room with two windows, either opposite or at right angles to each other, these windows provided with white shades—and opaque shades also, if it can be so arranged—is the proper thing. If one of the windows faces the north, and if the walls of the room are white or any light color, so much the better. I am fully aware that I am sadly heterodox in suggesting two sources of light, but wait; the operator will see what the use of two windows is, and it is far easier to shut off superfluous light than to struggle along with half enough. If you can't get north windows, take any other aspect. The principal thing is to have plenty of light from *some* direction, and to have it under control.

Backgrounds. In addition to the room, accessories of several pieces of cardboard, the full 22 x 28 size, or larger if possible, will be needed, these cards to be both white and dark. The mounting card known as "carbon black" is most excellent as a dark surface; and a large shaded "Rembrandt" mount will also be found of much utility. The backgrounds must be free from gloss, else one has an extra trouble on hand when there are enough other items of bother! A dark gray cloth of rather smooth, even texture—as serge or flannel, or, what is even better, felt—forms a very useful background; but it must be so kept as to be free from sharp folds. One of the very first things the flower operator needs to do is to photograph the various backgrounds, or pieces of them, all together, so that a comparative view of their various tone values may be had.

Several of the best workers lean strongly to either pure white or dead black backgrounds—the former obtained by white cardboard and the latter the result of the use of black velvet. While these adepts get some charming effects with the violent contrasts thus afforded, the novice



POET'S NARCISSUS
W. J. Cassard



WAKE-ROBIN (*Trillium grandiflorum*)
J. Horace McFarland

is advised to study first the neutral grounds, arising from the use of the gray cloth above suggested, and then to work also with the shaded "Rembrandt" card, before attacking the white and black effects. The shaded or neutral grounds are richly artistic, they are far more easily reproduced by half-tone if typographic use is ever made of the photograph, and they give a vast field for interesting graduated effects by varying the lighting.

Vases, etc.

Next to be provided for this branch of the work are vases or receptacles for the flower compositions. These are best if severely plain and simple—it is not the photography of ceramics we are undertaking, and an elaborate vase or pitcher will surely divert interest from the blossoms it is merely to hold in place. Straight, plain, clear glass vases are most excellent, especially those of few curves. There should be several vases: one with a narrow neck for single flowers, as a rose specimen; another with wide opening, for a bunch of daisies or the like. A heavy beer glass is often a joy in this use. Cut glass must be very sparingly used, or the brilliant facets will make all the picture. Plain earthenware or dark blue dull-glazed mugs afford much variety and some good effects. The exquisitely shaped and low-priced, undecorated earthen bowls obtainable at stores dealing in Japanese goods offer many possibilities in preparing flower compositions. Small pitchers are excellent for some uses; flat dishes of oblong shape are also useful in some compositions. Of the main importance is simplicity in form and in character; keep that in mind, and both will selection be simplified and expense be restrained.

Preparing the Subject.

With the camera, plates, backgrounds and vases ready, we may now look out for our material. We are dealing with perishable things, and they demand the most careful handling if we are to catch their evanescent charms upon the sensitive plate. To start with, let us take flowers of considerable staying qualities. Carnations may be had almost anywhere and at any time, and if they have not "stayed" too long with the florist before you get them, they will afford good practice. It may be thought an advantage if the worker is permitted to pick the flowers from the plants, taking them immediately before the camera. It is not an advantage, but the contrary. The ideal plan is to cut, not pull or break off, the flowers early in the morning, before the sun has touched them, and to put them at once into fresh water, a few degrees *warmer* than the dark, cool cellar or other location in which they should then be placed for an hour or so. So treated, they will fill up with water, and be then in fine condition to stand handling and photographing. Even the most delicate and shy wild flowers may be revived when quite wilted if treated upon this plan, remembering, too, that moving dry air will wilt them faster than anything else.

If the flowers must be transported any distance before photographing, be sure to have them wrapped in paraffine paper, or packed in a tin box so that evaporation is checked. They may wilt slightly from the confinement, but when the stems are cut off, the flowers placed in lukewarm water and then stood for an hour, or even over night, in a cool, dark place, away from moving air, they will almost surely revive, and often improve.

Let me say here that in some years of loving work with flowers, I have never observed the so-called heliotropic or sun-following movement during exposure. I have been told that my flowers would turn toward the sun, and that they would also expand during even a brief exposure; I have been gravely informed by one who posed as an authority that the only time a flower could be photographed was within fifteen minutes after it had been cut, the blossom then being in a state of shock which would keep it still! But these and other theories have fallen before the common sense of practice; and the simple plans above mentioned will enable anyone who loves flowers to keep them and handle them in photographing. Keep the hands off, though, as much as possible; the less any flower is touched, the better it will "stand up."

To return now to our carnations. Get for a start, and for comfort, several white and several of a rather deep pink, not red; and if you can manage it, obtain some unopened buds and some of the peculiar glaucous green foliage. When they are filled up with water, as before noted, arrange them in a vase.

Arrangement: Focusing.

Now it does not seem particularly difficult to arrange flowers agreeably in a vase. Neither is it, for some people, with some flowers, for some purposes. But here we are "up against" our first technical difficulty. Get the arrangement made, put the vase with its flowers on the table or box placed to support it, put behind it the background selected, and then focus the lens upon it. It will at once be seen, if in a strong enough light, that a sharp focus cannot be obtained upon all the flowers, because, if there are a dozen carnations with long stems in the vase, they occupy a space, from back to front, of perhaps ten to fifteen inches. Of course, by stopping down the lens more depth of focus is noted, but probably not enough to prevent the flowers in the front or back, or both, from being most distressingly "fuzzy." It will be found that there is nothing for it but to rearrange the flowers in a plane parallel with the lens and ground glass. Probably a fine cylindrical arrangement has been made, but we need, to get sharp results, a fan-shaped arrangement. With much patience this can be made, and so made as to *seem* on the ground glass to be natural, and free from stiffness. The difficulty of knowing what point to focus upon with the lens "wide open" may be surmounted by selecting a point slightly in front of the center (on a plane parallel with the ground glass) and focusing sharply upon that; for as the smaller stop increases the depth, it will be found to do so equally each way. An engraved white card with fine sharp lines, or any paper with a sharp line drawn, printed or engraved upon it, will enable the focus to be obtained very quickly, if it is placed on a flower at the selected point, and focused upon. Don't forget to remove it, however, before exposure!

Lighting the Subject.

When once arranged to your satisfaction—or as near to it as you can attain!—the lighting becomes important. If you are working near a north window, take a position with the camera which will bring the flowers a little to one side of the direct light. Do not, for such a subject, photograph full at the carnation, in the direct line of the light; some shadows must be "hidden" in the flowers, if they are to have any form. If both white and pink flowers are in the composition, endeavor to turn the white flowers *away* from the strongest light—they are so very easily over-exposed. By half shutting the eyes, the shadows can be seen (looking at the flowers, of course, from the position of the lens), if there are any; if not, move the whole arrangement until shadows can be noted, especially in the white flowers. Remember that the white flowers need to be lighted less than the pink, if possible; and that the foliage needs full light.

If the work is being done by one window, by all means use a white reflector on the side opposite to the source of light, to throw soft light into the shadows. If two windows are available, the second one may be partially screened, admitting only enough light to soften the shadows. I have made hundreds of successful flower photographs in a studio where the light comes from the east and west, and sometimes great help has been had by admitting the *opposite* light for a fraction of the whole exposure, to round the image and soften the shadows.

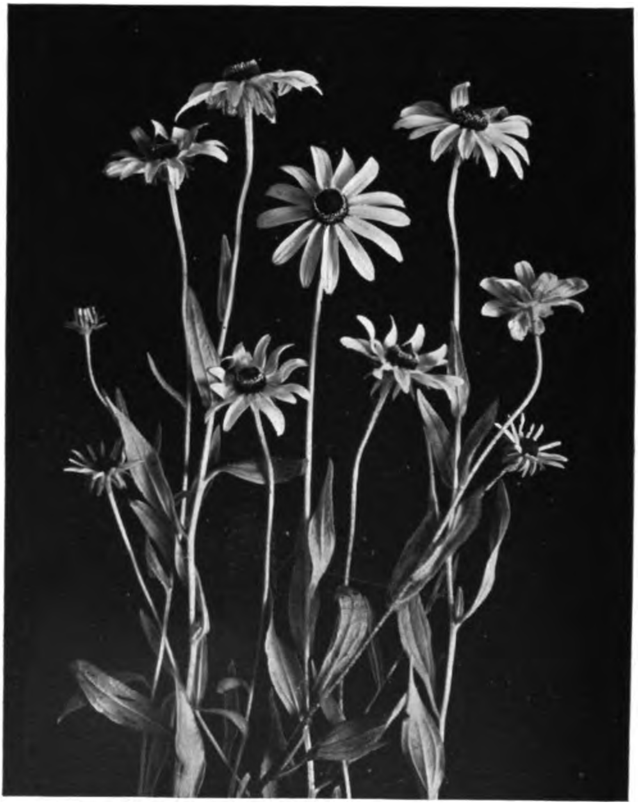
Exposure. With these points decided, the focus obtained, the proper stop set (and it will usually be found necessary to work with a rather small opening, say *f*/30 or *f*/42), the exposure must be decided upon. Those accustomed to the use of an exposure meter will, of course, take its guidance, though the necessity for avoiding any loss of time will suggest the simplest means and the promptest action. A plan which has been found very satisfactory in practice and which has the advantage of cultivating and disciplining one's judgment, is to adopt what may be called an exposure *factor*, and to calculate from this what exposure to give. For instance, on this carnation subject, we may have a light which by experiment has been found sufficient to give a fully exposed portrait negative, with a fast plate and a wide-open lens, in say three seconds. Now the lens is stopped down to *f*/30—that is 16 times the exposure; also, we have possibly cut off some of the light to gain softness, and we are working with say a *Cramer Instantaneous Isochromatic* plate, which is 25 per cent slower than the fastest. For the last two items we add another second to the basis, and decide the exposure as 4 × 16 = 64 seconds. Both prudence and experience dictate a little for leeway, and we give an exposure of 75 seconds, remaining absolutely still during this time, to avoid shaking the flowers.

The development, at least at first, should follow immediately, if at all possible, as in no other way can experience be obtained so quickly and cheaply. Having made a full note of all the circumstances — name of flower, lens, stop, plate, time of day, character of light (whether bright sun, hazy sun, cloudy bright or cloudy dull outside), and length of exposure, we take our holder to the dark-room, and, carefully dusting the plate, pour on it the selected developer.

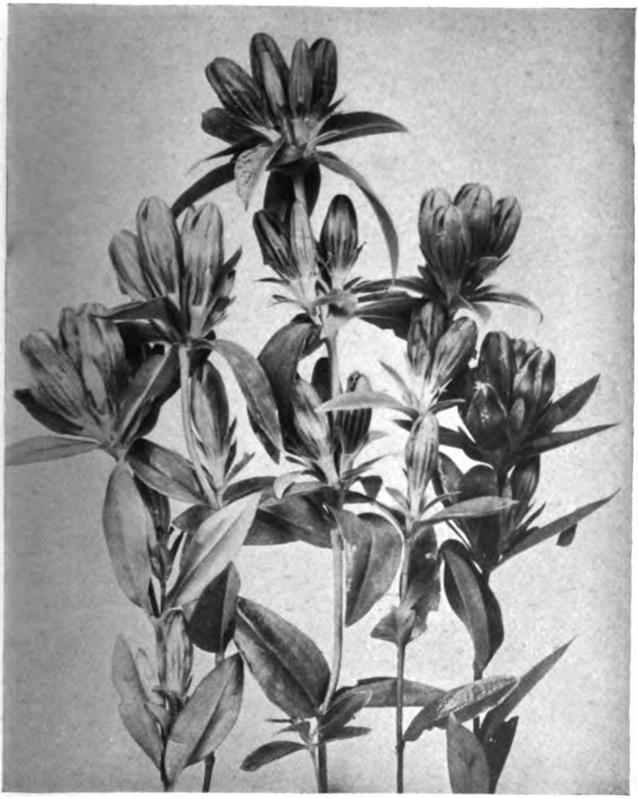
For flower photographs, delicacy is more often wanted than brilliancy, and hence the developer should be one which will not give a "hard" negative. It is presumed that the worker has had some previous experience, and has control of his developer, so that he will know when to stop or when to push. We have white carnations and pink ones; we must not have both come up equally strong as to density. The foliage should not be too much accentuated; if flowers and foliage are alike, over-exposure is plainly indicated. The "Universal" developer described on page 11 I find satisfactory.

The carnation composition, will doubtless keep in order for another exposure, in which the faults of the first

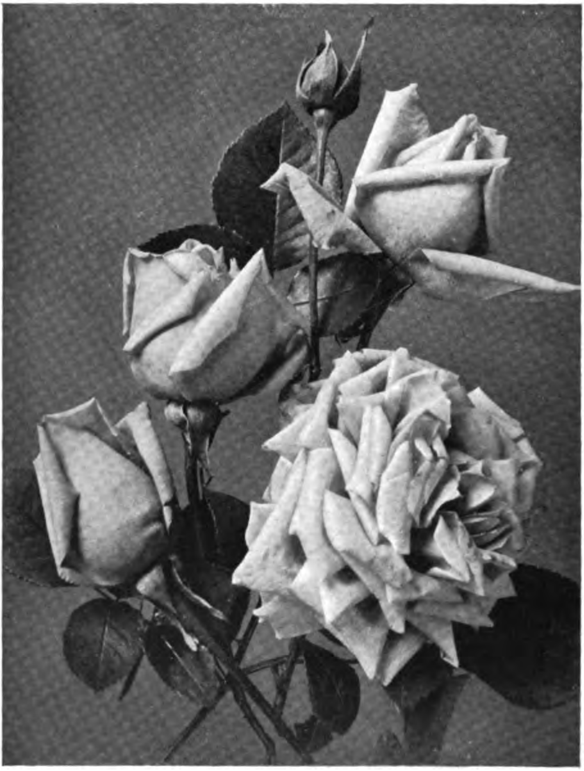
SINGLE DAHLIAS
J. Horace McFarland



BLACK-EYED SUSAN (*Rudbeckia hirta*)
Henry Troth



CLOSED GENTIAN (*Gentiana Andrewsii*)
Henry Troth



LA FRANCE ROSES
J. Horace McFarland

negative, if any appear, may be corrected. If circumstances prevent immediate development, it will be best to make two exposures at first, giving each a different timing, and noting the result for experience. By exposing a dozen plates upon various subjects in the same place, under differing conditions as to light and time of day, we will get a fair knowledge of the time required, and accumulate also some experience in the handling of the light.

I have suggested a trial with white and pink carnations. If the negative shows a flat black shape for the white flower, the lighting has been defective, and will need to be carefully studied before using another plate. Particularly is this important in working with white and light flowers. To show white we must show shadows, and a flat front light will not do this. A good way to get information without using plates is to pass cards of both dark and light shades between the source of light and the flowers, keeping the eyes fastened, meanwhile, on the flowers and noting the play of shadows. Sometimes the excess of light comes from above, and a portion of the window must be screened off. In a room with white walls and two windows there is usually a very strong diffused light, and to get the modeling and form of white flowers, dark shades must be used.

Getting Experience. Having worked out the problems of exposure and of lighting upon the much enduring carnations, other flowers may be taken, and especially other colors. I want to emphasize the fact that a dozen or so plates used upon logical and consistent experiments, even if but one good negative results, will be found to have been well used; for an ounce of practical experience is worth many pounds of haphazard attempt. Get your experience first, and get the results down on paper, noting carefully every detail of plate, lens, stop, time, exposure and development.

Shades of yellow may be well experimented with next. Yellow carnations can be had, of rather a light hue, and they are mostly striped with red. Make a composition of white and yellow, and, of course, use isochromatic plates. Do not be satisfied until a negative is obtained which shows for the yellow a lower color value than a white. A bud of the *Perle des Jardins* rose, easily obtained from any live florist, will give a very good shade of floral yellow; or, if the experimenter is working in the growing time, common dandelions will give a deeper yellow to try upon. While getting this first experience, keep to the arrangements of flowers in vase, leaving the more artistic compositions for the later time when a certain basis of technique shall have been established.

It will be discovered soon that the deeper yellow shades require considerably longer exposure, and will stand a much stronger lighting. Also, it will appear that shadows are far more easily obtained, so that the character of the lighting may have to be considerably modified.

Now come to the brilliant reds of nature, which, alas, are anything but brilliant on the developed plate, even though showing so crisply upon the ground glass in vivid hues. They are the despair of the photographer, for, as is well known, red rays have but little influence upon the most sensitive photographic plate. And the brightness of scarlet, which is in such strong contrast to the green of the leaves, drops to a flat level with the tones of the same leaves when with difficulty fastened upon the photographic plate.

But we must photograph the red posies, and do the best we can. When a purely panchromatic plate is devised, the work will be easier, I hope.

Taking, then, a red carnation for experiment, and for purposes of comparison, accompanying it with a yellow one, let us make the trial. There need be now no hunting for shadows — the chemistry of our work provides plenty of them — and we want the most brilliant and penetrative light we can have, short of sunlight. It must shine right into the red flowers, too; and here is a chance for a very neat bit of operating. If at all possible, get the strongest light on the red flower, a weaker light on the yellow flower, and still less on the foliage. If the latter gets the light and the exposure which are absolutely necessary for the red, it will not be of green value on the finished print, but *white*. It is best, therefore, to either light the red flowers more brilliantly by locally-directed light reflected from a small hand-mirror, or, giving the whole composition a brilliant light, to shade locally the foliage and the yellow flower. This latter, the easier plan, can be managed with a card, or palm-leaf fan, or anything which will intercept and soften part of the light. To so place the red flowers in the arrangement that they get the most direct light is usually quite feasible, and this will sometimes be sufficient.

Developers and Development.

For shades of red, the exposure basis must be much longer—from three to six times that required for white and pink. In developing, detail in the red must be coaxed out by every art of the photographer, while at the same time, bromide will probably be needed, locally applied, to restrain over-exposure on the green and the yellow. It is almost useless to try to obtain satisfactory pictures of red flowers in a weak light, even with long exposures, and it is a well-known rule that length of exposure does not present an equivalent for brilliancy of light.

Combinations of red and white flowers are almost impossible, photographically, for the exposure necessary to get any sort of detail on the red will almost fatally over-expose the lighter hues. If it must be done, try to light the reds locally, as before directed, and in development work for restraint. The formula given by Cramer as "Bromo-Hydrochinon," is most excellent for this work, and, indeed, for all over-exposures.

Bromo-Hydrochinon I: Distilled or ice water, 25 ounces; sulphite of sodium (pure, crystals), 3 ounces; hydrochinon, ½ ounce; bromide of potassium, ¼ ounce. II: Distilled or ice water, 25 ounces; carbonate of soda (dry), 3 ounces.

For use, take equal parts of I and II. Use full strength; and if there is any reason to suspect ten or more times a normal exposure, start with used developer, or with half the quantity of II.

For ordinary work I believe in and use the following:

Universal Developer. (Dissolve in order given.) I: Distilled or ice water, 24 ounces; metol, 1 drachm; eikonogen, 1 drachm; hydrochinon, 1 drachm; sulphite of sodium (pure, crystals), 2¼ ounces; citric acid, 15 grains; bromide of potassium, 5 grains. Dissolve with the aid of gentle heat; leave stand a half day after solution is apparently complete, and filter into 8-ounce bottles. II: Distilled or ice water, 12½ ounces; carbonate of soda (dry), ¾ ounce.

For use take 1½ ounces of I, ½ ounce of II and 2 ounces of water, using a few drops of 10 per cent bromide solution if plates do not work clear. In summer, increase quantity of water as needed; and for over-exposure, use less II and more bromide. The used developer may well be kept in a full bottle, tightly corked, and is excellent for starting development.

With normal exposure, and in a temperature of 70 degrees Fahr., the image should begin to appear in from 45 to 60 seconds, and development may be continued five minutes or more. Detail may be coaxed out by the use of fresh developer, diluted with four times its bulk of water. A few trials will soon show the proper point to which to carry development. The "Bromo-Hydrochinon" may be applied for a moment to gain density, if necessary.

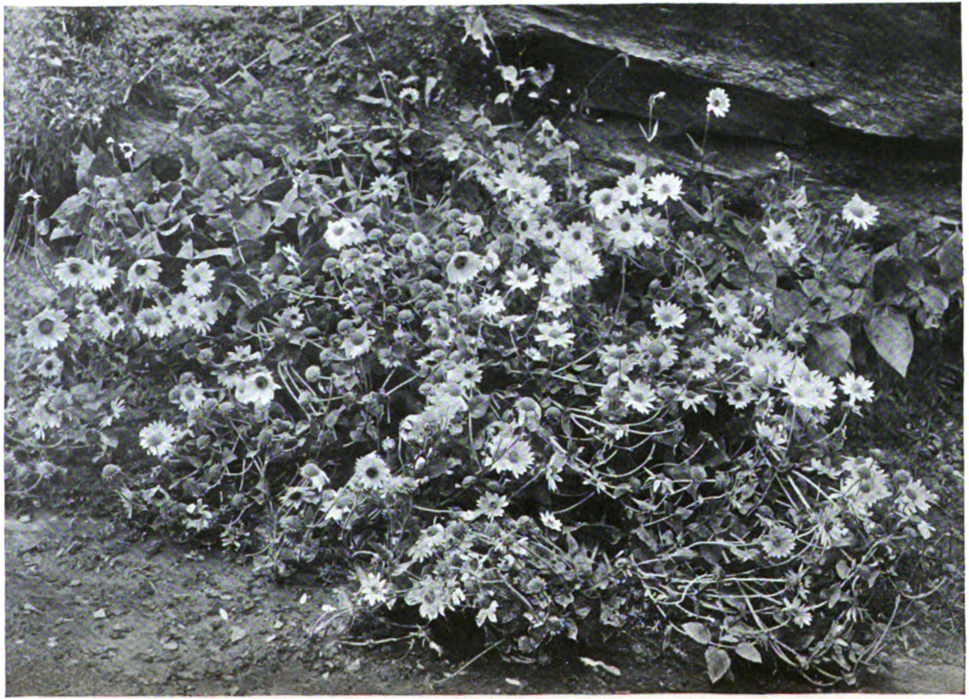
The Use of a Ray-Filter. The treatment of blues must be taken up with the ray-filter if approximately true color values are to be had. The various trade screens are available, and the special preparation of a bichromate cell has been described on page 3. This ray-filter will lengthen the exposure about two-and-a-half times. Pansies afford the most easily obtained material for experiments in working blues, and they, at the same time, give all the shades of yellow, with some odd hues which may be studied to great profit.

With some experience gained in the handling of flowers of various colors, the work of artistic composition can be profitably taken up. A bowl full of violets (and here the ray-filter is essential), a great *American Beauty* rose dropped on a snowy table-cover, daisies and buttercups in various arrangements—there is no limit to the beautiful pictures that can be made. The springtime will bring a host of opportunities, and the exquisite fruit-tree blossoms, the fresh opening leaves of many greens, all invite and tickle the photographic nerve. Take your camera with you, and it will show you new beauties in the great world out-of-doors, while the flower reminiscences on your plates will serve many a need, give many a pleasant hour to your friends and yourself.

Flowers "Life"-Size. The second division of our subject—the photography of flowers in "life"-size, or nearly so—presents many interesting problems, and some features of comparative novelty. One has only to call to mind the average natural size photograph as accomplished by the professional with a portrait lens, to know that such productions leave much to be desired, from every standpoint.

Apparatus. This work differs essentially from ordinary view and composition photography in that some special apparatus is absolutely essential to success. A suitable lens and a camera box of sufficient bellows extension cannot be dispensed with; and success is made far more practicable and certain if a special form of camera stand is employed. When we come to work in natural-size photography, the difficulty as to obtaining sufficient depth of focus becomes acute. A handsome *American Beauty* rose, for instance, in its rich setting of foliage, carelessly inserted in a graceful narrow-necked vase, is a fine object, and would afford a charming photograph on an 8 x 10 plate—if only a reasonable sharpness could be had over a sufficient part of the surface. Try the experiment, as to arrangement, and when the composition is completed, measure

HOLLYHOCKS
J. Horace McFarland



SOFT SUNFLOWER (*Helianthus mollis*)

the depth of focus which would be required to get the flower sharp, and the leaves free from excessive "fuzziness." It will be seen that a lens which would give from 6 to 10 inches of acceptably sharp focus at full size is required; and this is optically, as well as practically, impossible, even with the smallest diaphragm and a consequently long exposure. Promptly the idea comes, to get the rose flat against something, and thus reduce the depth required. We proceed to put it up against a background, only to discover that the flower resents such treatment strongly, losing much of its grace. We also find, if we make an exposure, that the background is much in evidence, and that unpleasantly heavy shadows obtrude themselves. It is also noted in following the suggestions given in previous pages as to lighting, that it is hard to manage so as to avoid flatness.

If we could lay the rose down and look at it with the camera in a vertical or nearly vertical position, several of the first-named difficulties would disappear; and if we could secure the flower practically floating in the air, so that the hard background shadows were eliminated, the balance of the troubles would be at an end. Just this can be accomplished with a form of vertical camera stand, to which is attached a plate-glass exposing surface or platform; and the vertical apparatus, if made easily portable, will also help greatly in giving perfect control of the lighting. Several such forms of apparatus are hereafter described and illustrated.

For consistency's sake, we may well begin to consider our apparatus by taking up the lens question. For natural-size work a wide-angle lens is a necessity, not a mere convenience. A study of lenses, in connection with No. 1 of THE PHOTO-MINIATURE, will explain why, wherefore we do not discuss the optics of it. A larger-sized camera than 5 x 7 will be found very desirable also, because of the obvious limitations when one takes up large flowers. The whole-plate size, 6½ x 8½, is my favorite for this work, and a lens of good quality which does not exceed 7½ inches focal length is about right to use with it. With such a lens, and a bellows which will extend to 18 or 20 inches, at least, we are well equipped.

The camera box should have a rising and shifting front, and a single swing. It will be found to be a great advantage if the rising front is operated by a tension screw so that it may be held exactly where it is wanted, rather than controlled by a stud working in a ratchet, whereby the movement is in certain arbitrary distances. When flowers are once arranged before the lens, we want every facility for locating the view on the plate without disturbing the fragile subjects themselves.

Vertical Stands, Etc.

Now as to the appliances for looking downward with the camera. There are several such devices, and nearly every worker of much experience has some sort of a plan or machine, more or less useful and practicable. By far the best is the form illustrated in Fig. 1. This is a studio camera stand, suited for many uses. It is perfectly adapted for horizontal, as well as vertical work, and by the addition of a couple of supporting sticks and a cloth to shut out superfluous light, together with a turn-table device for holding negatives, it becomes a most excellent lantern-slide and transparency apparatus. This is mentioned because many who would hardly feel like having such a stand made for flower photography alone will find it entirely practicable in its combined usefulness. Indeed, no one with much studio work, such as the

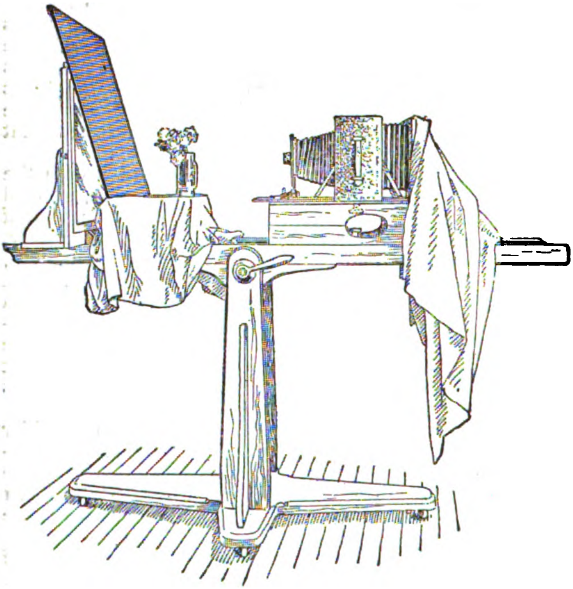


Fig. 1.

photographing of various objects of small size, copying in any size, enlarging, lantern-slide and transparency making, can well dispense with an equivalent apparatus. Its perfect flexibility permits so ready a use of any light, and such thorough control of the light, that I am sure any worker who once sets up such a stand will always regret to have ever to handle a tripod indoors again.

Two views of the stand are shown. The first, a side view, gives the appearance of the device with the track for the camera stand in a horizontal position, as when working on flowers which cannot be laid down, or on compositions in reduced size. The frame carrying the plate-glass then becomes a support for the background selected, and the article to be photographed is placed on a box in front of the background. The plate-glass frame is movable along the track, and the sliding stand for the camera, in the center of which is a slot through which comes the tripod-screw to hold firm the camera, is controlled partly by a strong brass window spring, which tends always to pull it away from the plate-glass end. This stand, or box, is fastened by a large thumb-screw, easily accessible through the opening in the side of the box.

The method of control of the track, carrying both camera and exposing platform, is easily seen. This track is cramped between the two uprights, and the hand-lever at the side, working a nut on a screw-thread, serves to hold it firmly in any position.

Fig. 2, more important for the present discussion, shows the apparatus in position for flower photography. The plate-glass is nearly vertical, as will be noted —it can easily be made entirely so—and the relative distances are well shown, as the drawing was made over a photograph of the stand in a much-used studio. Note that keeping the plate-glass exposing platform some six inches away from the floor gives opportunity to slip in any background, out of focus, and thus unobtrusive. See, also, that while as here shown, the apparatus is arranged for making natural-size work, there is plenty of room for the camera box to be drawn back, so that objects on the glass can be photographed at a considerable reduction. Also, see that by bringing the camera still closer to the object, enlargement may be accomplished up to the limit of the bellows capacity of the camera.

The whole apparatus, which stands on a crossed frame, is mounted on smoothly-running casters, and it may thus be readily wheeled about without disturbing the camera or the objects being photographed. This gives a chance to make the lighting whatever one desires, and it will soon be discovered, not only that top light is much quicker than the often much-reflected side light, but that it is far more easily controlled, in every way, giving also many desirable effects.

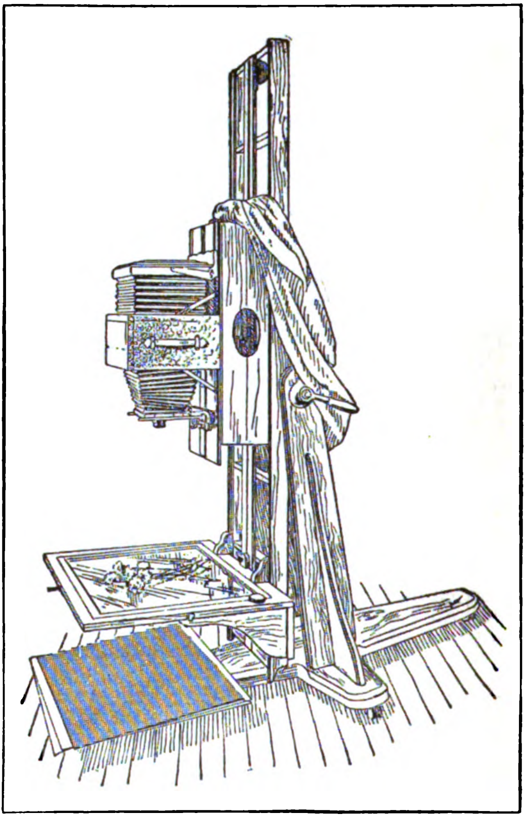


Fig. 2.

Reflections. There is just one troublesome feature which presents itself in connection with a downward position of the camera, and that is the matter of reflections from two sources—the ceiling of the room, if it is light in color and strongly lighted; and from the polished front and lens of the camera itself. A sky-light, of course, is worse yet, as I discovered to my sorrow after working one long day in a greenhouse, with no chance to develop trial exposures. I had numberless pictures of the sky-light windows in great and unwelcome detail! The only sure way to obviate these reflections always—and sometimes I have worked for months without once being bothered!—is to have a wire frame made to fit on the three sides of the front of the camera, flaring outward, and lined with black velvet. This cuts off all the side-light from the lens, and if it is made large enough, also shuts off the possibility of any reflection from the ceiling of the room. A diagram (Fig. 3) shows the idea. It is made so as to hook easily over the edges of the camera box, and one part is hinged, so that access may be readily had to the lens. This device may fold on itself, taking little space while not in use. A black cloth or a dark card, with a close opening for the lens only, may sometimes be satisfactory for the cutting off of reflections.

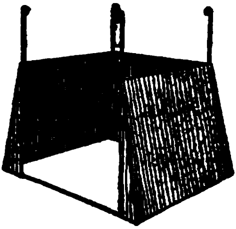


Fig. 3.

The above described camera-stand, which is a composite of the devices of a half-dozen experienced workers, may be well made by a good cabinet-maker for from $25 to $35, and all complete with the lantern-slide frame and turntable, and the ground-glass attachment, which is a necessity for that use, for about $8 more. A much cheaper and more simple frame, not so convenient, of course, is represented in Fig. 4. In either of these devices, the object is attained of securing a transparent support for the flowers, and thus disposing of the heavy shadows and objectionable background texture.

A Focusing Device. One more almost indispensable, but fortunately very simple, appliance may be quickly described. It is a focusing device, and is shown in Fig. 5. A piece of wood an inch thick is notched out into half-inch steps of a half-inch rise, and on these steps are pasted large figures (from a calendar, for instance), giving the inches, while a cross-line is drawn with India ink and a fine-pointed pen somewhere on each step. The use of this little thing will shortly appear, and it will save much time in obtaining a correct focus.

With the apparatus ready, and a location similar to that described in the first section of this treatise, we may begin, and for our first experiment let us choose again the long-suffering carnation, not only because it will stand handling, but also because it does not heap up difficulty by requiring great depth of focus.

Temperature, Etc.

A parenthetical note is in order as to the atmospheric conditions in the studio or work-room. I have seen fresh carnations, full of vigor and water, simply melt before the camera when used in a hot, dry room, the air in which was loaded with chemical fumes. Mr. Kurtz's magnificent studio, in New York, fitted for three-color photography at a great cost, was useless for photographing flowers, in themselves the best possible subjects for his process, because the good man could not be made to see that in an atmosphere of collodion and cyanide fumes, at a temperature of 95° to 110°, no self-respecting flower could be made to stand up five minutes. Therefore, keep the work-room as cool as possible, and have the air moist. If a bare floor is present, sprinkle it with cool water; if a carpet prevents this, dampen the air with an atomizer. This is being good to the flowers, and quite as important, it is restraining the dust particles in the air, which are apparently very anxious to be photographed full size. Lastly, keep the flowers in water until

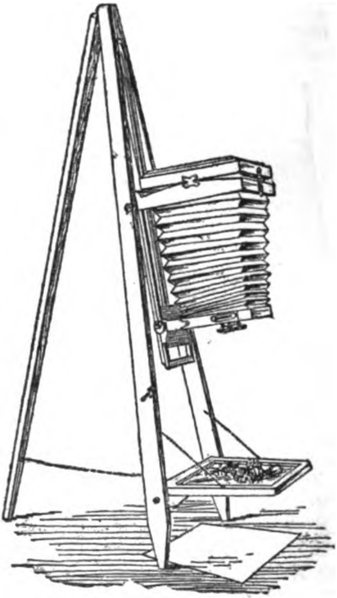


Fig. 4.

they are actually to be worked, and as they are taken out, dry off the water with soft tissue paper, or a rag which will not "lint." Drops of water on flowers, stems or leaves must be absorbed before an exposure is made.

Other Preliminaries.

Make a composition on the plate-glass with the carnations (first having carefully cleaned the glass on both sides, so that no specks, spots or dust atoms show), arranging them as you think best, defeating their natural stiffness if possible. The buds, if any are at hand, will help; and to get a look *into* one flower, it may be necessary to crack its stem just below the flower, propping it up from below, out of sight of the lens, with a little bit of wood or rubber. Before going too far with the work, look at it on the camera's ground-glass, so that the right position on the plate is assured; it is not easy to move successfully a finished composition.

Also, get the focus *before* finishing the composition. To work full size, the lens must be equidistant between object and ground-glass. If a 7-inch lens is in use, the distance from the flowers to the lens must be 14 inches, and the camera will need to be pulled out to that distance also. Here comes in the great utility of the little focusing device illustrated in Fig. 5. Instead of worrying long in an attempt to find the proper spot upon which to focus, slip the device into the composition in such a way that the light will fall strongly upon the steps. Note how many inches high the flowers are, from the glass to the extreme point. It may be three inches. Now, as we want the sharpest focus in front always, and as the focus deepens equally from a central point when the lens is stopped down, focus upon the 2-inch step, getting that perfectly sharp, without paying any attention to the flowers. In my own practice I usually sharpen upon *two* numbers equally, and this diffuses the focus somewhat better. In this case, it would be upon the 1½- and 2-inch steps. It will be found probably much easier after obtaining nearly the size and focus by the camera front, to get

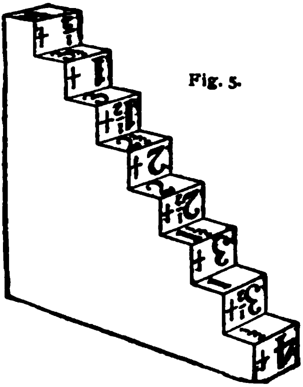


Fig. 5.

the final sharpness by moving either the back or the whole camera up and down. The heavy spring upon the sliding camera stand helps in this work, taking up much of the weight. The ideal arrangement would be a rack and pinion upon the camera stand for focusing, and I hope prosperity's smile will eventually encourage me in obtaining such a time- and strength-saving adjunct.

Sizes may be more readily ascertained, and exact locations upon the ground-glass obtained, if it is carefully marked off into inch squares, ruled with India ink on the ground side. Diagonal lines, crossing the exact center, will also be obviously useful.

The location obtained, and the composition made, we must consider the background. Try for this first exposure a neutral ground, afforded by a dark gray card board, slipped under the plate-glass frame, which, as noted, is some five or six inches from the floor. The character of the background may be greatly modified by its lighting, as a little experience will show. Often it may be tipped up at one end, to advantage, and sometimes I have secured a fine atmospheric effect by fixing the card into a semi-cylindrical position, excluding light from two sides under the plate-glass. Experiments with various backgrounds will soon provide the operator with much valuable data, and teach him certain means of obtaining certain ends. As before mentioned, a graduated background, as afforded by a large *Rembrandt* mount (obtainable in 22 x 28 size of the platinotype people, Willis & Clements), will give many charming effects. Large sheets of printers' cover papers, of antique finish and dark shades, are admirable backgrounds. *Princess*, *Belgrade*, *Oriental*, *Manhattan*, *Imperial* and *Herculean* are trade names of some suitable papers, and there are many rich shades of each.

Lighting.

Now comes the question of lighting. If our carnations are white, or pink, or yellow, or a combination, we need a rather uniform light, striking first the tops of the flowers, and all that has been said about the absolute necessity of "hiding shadows" in the flowers comes most strongly into force. By moving the stand, and watching the play of light and shadow; by manipulating the curtains to either or both of the windows; by holding up various cards as reflectors or shades, we get many different lightings. Be careful that the centre of the composition does not miss the light that the sides are absorbing, and develop into a nasty under-exposure. Try also to have a sufficient light on the stems and foliage, without admitting or reflecting so much light on the shadow side as to flatten the whole composition. It will soon be found that troublesome interior shadows may be illuminated softly by light reflected into them by a white cardboard, and the great advantage of a double source of light (such as is afforded by windows opposite or at right angles to each other) will appear. As before noted, a brief flash of brighter light into the shadows during a small part of the total exposure will often give beautifully clear but not hard detail in the darker parts.

Exposure. The time of exposure can only be learned by experience and the using of plates. The larger size means longer exposure, of course; but how much longer depends so entirely on purely local and incidental conditions that it cannot be more than hinted at. I do not use an exposure meter, but work with an exposure *factor* (see page 8), and if one has done his fair share toward the prosperity of the amiable dry-plate manufacturers, with a due exercise of the bump of remembrance, he should be ready with a factor for nearly every kind of weather and time of day. Beware of the deceptive light of early morning and the yet more deceptive yellow radiance of the waning day. Both times need far longer exposure than at first seems requisite, and the evening light, while beautifully soft and often strongly orthochromatic, needs much time to act. Also, note the tremendous activity of the chemical rays from 10 A. M. to 2 P. M. of summer days, especially if hazy clouds diffuse the light.

Try two or three plates, at different exposures, on the same subject, and thus obtain some needed experience at the start. Our carnation subject will await us while we take the holder into the dark-room and perform that ever-mysterious incantation called development, which shall bring out faithfully upon the creamy white surface of the plate all the lines and shades of the flowers, if our exposure has been "normal." And here let me say a word or two about development. "Normal" exposures are, of course, always vastly preferred; but alas, how few they are! The portrait photographer, working days and weeks and months in the same studio and with the same plates and the same light, upon the same human "mugs," gets to be an automatic machine as to exposure, and he has normal exposures all the time. But the amateur, working once in a while, and with ever-varying materials and conditions, cannot have the machine-like regularity of his professional brother, and must therefore use the great resources of skilful development to make up for mistakes in exposure. The portrait artist may, and often does, send for his sitter again; but those of us who chase the gems of the field know that our subjects, many of them, can be sought for, with much effort, but once a year. Their delicate texture is all too frail for the camera's burning glance, and the basilisk eye of the lens may rest upon them but once only. Thus we see the importance of getting experience with the hardier sisters of the greenhouse fraternity, so that our attempts with the rare and delicate treasures of the field and meadow may be successful at the first chance they afford us.

Development. Now while development affords resources for over-exposure, it will not bring out what has not been put upon the plate by light action. Under-exposure is failure, notwithstanding the freak developers which periodically claim to give a good image at "one-third the exposure of any other." Therefore, avoid under-exposure! When I look over my negatives, and see—alas, too often!—the "might-have-been" members of the family, those which needed only another fraction of time, I am moved again to exclaim, "Under-exposure means the ash-pile!"—or some other abode of departed possibilities.

But to details. We have exposed according to the best information, and we think we are right. It is the height of recklessness to pour on the active, fresh, normal developer upon the uncertainties of our exposure. No; let us feel our way. Slip the plate into the tray in almost entire darkness, and cover it with a card or another tray while a "tentative" developer is prepared. If we work one of the benzene ring of reducers—hydrochinon, eikonogen, metol, tolidol, or the like—and have kept a little of it that has been used before, that is good to try our exposures. If the image comes up quickly—within 15 to 30 seconds, in a temperature of 70° F.—we have over-exposure to deal with: the weak developer must be poured off, the plate quickly rinsed in *cold* water, and the developer for over-exposure applied. In general, it is the first 60 seconds that decide the ultimate fate of a negative, for if a normal developer be allowed to act that long on an over-exposed plate, flatness is sure to follow.

As this is not a treatise on development, that subject will not be pursued, more than to say that it is important to avoid hardness in flower negatives. We will have constantly to deal with extremes of contrast in white flowers and dark green leaves, and the deposit must not be of the "soot and whitewash" character. Therefore, a developer is indicated which will not give the greatest density. (See No. 11, THE PHOTO-MINIATURE: *Developers and Development;* also, see formulæ on p. 11.)

More Experience. To return to our poor carnation flowers, all this time wilting before the lens while we are experimenting and philosophizing! We may, if we find the first exposure too long or too short, try another, and then pass to other flowers and other compositions. The remarks previously made about red and yellow flowers, and concerning ray filters, apply here with double force.

The most difficult flowers, often, are large white blossoms, with deep green foliage. A great white rose, as *The Bride*, or *Captain Christy*, presents an extreme of contrast which will tax all our skill, alike in composition, lighting and development. The beautiful native "wake-robin," more generally known as *Trillium grandiflorum*, is another subject of much elegance and equivalent difficulty, because of its contrasts of white, blush-pink and deepest green. A gorgeous blue and white pansy, with a yellow eye, or a cluster of the delicate wistaria, or the lovely "bluet" (*Mertensia Virginica*), or the stately purple and gold iris, will test the control of contrast and the resources of orthochromatism.

In general, it will be found that great contrast in the subject must be met with soft and fully diffused light, especially in dealing with white flowers and glossy leaves, which latter are simply unmanageable in a brilliant light. The beautiful kalmia, or mountain laurel, is a case in point; its deep, shiny leaves, together with its exquisite cup-shaped white flowers (in which shadows refuse to hide) and its delicate fluted pink buds, are my despair! I hope some one who reads may have the joy of a full triumph over the photographic difficulty of this glory of our Allegheny mountain-sides.

Where red is to be photographed, a brilliant light is essential. The bright *Crimson Rambler* rose, for instance, must have the light, sharp light, poured *into* it; and still more will its greater sister, the queenly *Jack*, and other crimson full-bosomed flowers, need brilliancy of direct light. Give such flowers three or four times the exposure deemed necessary for lighter subjects, shade the foliage as much as possible, and develop with a strongly restrained reducer. The "Bromo-hydrochinon" formula, already given, is advised as peculiarly adapted for this work; it affords density without undue hardness.

Flowers Pendent. Notwithstanding the great value of the apparatus for downward exposure, it must not be used for all subjects. Some of the most beautiful flowers are in pendent clusters or racemes, and cannot be laid down without losing all form and grace. The fragrant blossom of our common wild locust is one of these subjects, and not only must it hang, but hang at the same angle as on the tree, if a natural photograph is to be obtained. Indeed, the artistic worker will in every case try to so dispose the flowers he is endeavoring to perpetuate upon glass as to give a natural air to them. "Bouquets" are usually stiff and abominable, unless they closely follow nature's disposition of bloom, bud and leaf.

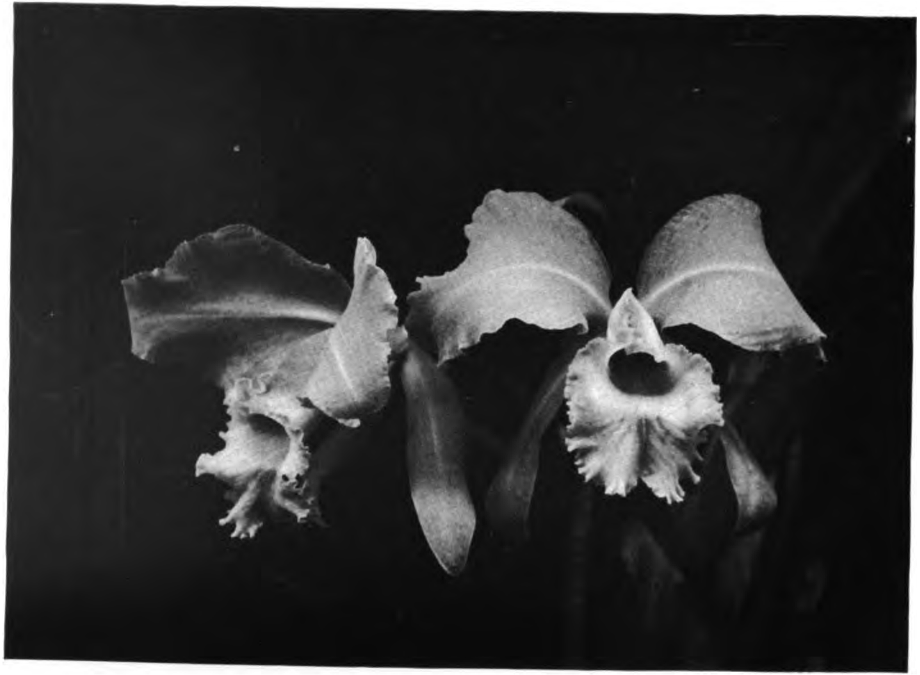
In photographing these difficult pendent subjects, I have usually found it best to use a vase, kept out of the composition if at all possible, though sometimes it *must* show. Sometimes, too, the flowers are secured on longer branches, and tied in a natural position, the branch running off the side of the plate. A little experience will soon show the worker of artistic tendencies how many beautiful things he can do, if he mixes much brains with his developer, plates and camera.

Suggestions.

I cannot leave this section of flower-photography in natural size without suggesting some lines of work. The earnest amateur will soon be delighted with what can be done, and he will want a definite object. It is easily had. Take up a whole family—the rose, for instance. Follow it from the lovely sweet-brier through the glories of reds, whites, pinks and yellows of every form and style and fragrance, clear to the newer single types, as the dainty multiflora, the royal *Rugosa*, the vigorous *Wichuraiana*. Take up the blossoms of fruit trees, and get keen enjoyment out of cherry, apple, pear, plum and quince flowers, finding many difficulties and much satisfaction. Or hunt up the common, yet unobserved flowers of our native trees—the white maple in early March, the American elm right after it, the red and the Norway maples, the catkins of birch and poplar, the gorgeous horse chestnut, the lovely dogwoods. I well remember the enjoyment I had in mystifying friends with a photograph of the flowers of the Norway maple, which all admired, and none recognized. And the exquisite yellow, green and orange flowers of our native tulip tree, the *Liriodendron*, when photographed in true values, will also astonish and please. The splendid white blossoms of the dogwood are attractive, and difficult enough.

The "promised land" is open to every nature-lover; go up and possess it. No aristocratic orchids need apply; this is a democracy of beauty for all.

AMERICAN BEAUTIES
W. J. Cassard



ORCHID (*Lælia anceps*)
William C. Metcalf

PANSIES
J. Horace McFarland

DARWIN TULIPS
J. Horace McFarland

Flowers in Their Natural Haunts.

Addressing now the third division of our subject—though it must be confessed that the division lines are extremely vague, and that much mentioned in each section is equally applicable to all—we take up perhaps the most interesting part of floral photography: the picturing of the blooms where they live, outdoors, as nature (sometimes assisted!) places them. For, however well we may succeed in photographing compositions and combinations, and however excellent may be the technique in working specimens in life size, we miss the greatest beauty—that of environment and situation. For decorative effect the combinations are most charming, and the full-size studies not only have often a special beauty but a decided scientific value. It is where the wild things grow, however, that they are most fitting and most attractive, and it is in their natural situations and environments that we now wish to study them photographically.

It is by no means simple landscape photography that we take up, for in nearly every instance the landscape must be subordinated to the main feature. We must have in the picture, if it is to be a picture and not a mere photograph, a jewel of nature in a setting of nature's devising; and this may well apply, too, to the locations where the art of the landscape architect has supplemented nature, for the aim of any true artist who works with God's plants and trees instead of man's paints and brushes, is always to produce natural effects. That is, truly artistic planting, be it ever so simple or ever so elaborate, is successful just to the degree in which the new conditions established stimulate some of nature's varied situations. Thus we may joy in photographing a wild thing—or a cultivated one, either—carefully and lovingly placed in an appropriate spot on the estate of a millionaire, just as much as if we found it in the deepest woods. Plants know when they are loved the finest "wild" flowers I know are suitably and happily located in an "American Garden," not forty minutes distant from Philadelphia's City Hall.

Tripods.

For outdoor work, we must of course use a tripod—I shall advocate no "snapshot" work. Provide one which is light but rigid, which sticks where it is set, will not vibrate n a high wind, and which has a broad top to give a firm support to the camera, together with an unforgetable, undetachable tripod screw. The tripod must not collapse easily, but should close up to a mere baton. Provide such a paragon of tripods, I say, if you can—I have never yet found it! But come as near to it as possible.

Camera. For outdoor work, the long-focus camera box of the folding type is by far the best. One which has space enough in its back to comfortably carry a felt case or bag with three holders is best; for long experience and much "toting" has taught me that the less separate items one has to carry, the better! The felt bag, by the way, is one of those unobtrusive little things which are really of great importance. What avails one's best skill if the plate-holder has been "sunned" a bit too much, or if a sudden shower wets the slides? The bag should be made of a rectangular shape, of heavy *dark* felt, not flannel, with a separate division for each holder, and a deep flap to tuck in the front. It is a tailor's job to make one, and I have paid 50 cents for each one I use, furnishing the material, and the holders, around which the bag is fashioned. It affords an easy means of carrying three holders, and may be laid on damp grass, or even for a time in the full sun, with impunity.

Another important trifle for field work is the focusing cloth. Avoid the rubber abominations which have nothing to recommend them but lightness. Get a piece of black "ladies' cloth," about 1¼ yards square, selecting a fabric that is light, but strong and closely woven. This will serve its purpose of excluding light while focusing is being done, and will also turn a heavy shower on occasion, as well as provide an available background.

The Lens. For an objective, the same wide-angle lens before recommended is the most desirable, though often a lens of normal focus is very useful, and sometimes the longer focus of the single combination will reach after a fine flower in an unapproachable place.

I am aware of my heresy in suggesting a wide-angle lens for outdoor work, but it should be remembered that in this case it is not used at universal focus to bring in the whole countryside. On the contrary, its special function is to emphasize the near-by plants or flower clusters we are after, and to subdue the importance of the background. Paradoxical as it may seem, the wide-angle is also quicker in this work than its aristocratic brother of longer focus and higher price! If we work, for instance, upon a rose-bush at a distance of five or six feet, with a lens of 10 inches focus, and there are trees in the distance, or other shrubs, we will need to stop down the lens to *f*/43 or thereabout, to get away from the nasty "shot-hole" appearance of the background; and if there is wind going, we have trouble on our hands and probably spoiled plates in our holders! Now, with a 7-inch lens, the background will be soft without painful sharpness, and also subdued in size, at an opening of *f*/22, taking not over one-third the exposure of the other lens.

For field work, isochromatic plates are almost an absolute necessity, because there is so much yellow to be considered. It will also tend to better results, and render one more independent of the direction of the light, if the plates are "backed," to prevent halation.

Plate Backing.

I have so much enjoyed a formula for backing (picked up in one of the annuals) which works most perfectly, and is free from the messiness and pinhole certainties of the caramel and other smear compositions, that I append it in full. Shake ½ oz. powdered castile soap in 10 oz. 95° alcohol, repeatedly, until partly or fully dissolved. (It is better to keep this on hand a week or more ahead, shaking the bottle when you see it. The solution is ready for use when half the soap is taken up.) Filter off 2 oz. of the soap solution, and add to it 10 grains of *erythrosin* and 10 grains of *aurin*, which will dissolve promptly. Paint the backs of the plates with this, and allow to dry. Use a very faint red light and much care in applying the coating, which is colorless in red light, but will be very apparent on development if it gets on the face! My plan is to coat the pair of plates just as it is taken from the package, without exposing the face at all.

Wipe off the backing with a wad of wet cotton before development, and rinse the whole plate carefully in a tray of clean water—all in very faint red light, of course.

The Ray-Filter.

A bichromate cell ray-filter, with the 1 per cent. solution as recommended, will prepare the operator for the shades of blue and lavender he may find, and will also enable him to get enchanting white clouds in a blue sky for his background occasionally. Let me drop a word of caution as to its use: always focus with the ay-filter on the lens, when it is to be used; for the refraction of two glass surfaces and the intervening liquid will make a very decided difference.

Weather Conditions.

For this outdoor work, weather conditions must be considered. It is very hard to get any satisfactory pictures in bright sunlight, and it is best not to start for a photographic jaunt on a day promising an unclouded sky. If, however, the work must be done on such a day—and very many of the flower jewels wait no man's pleasure for the time of their maturity and rapid decadence—work early in the morning or late in the afternoon, when the sun's rays do not fall so directly and there is more diffused light. Also, give at such times quite full exposures, and develop carefully for density, using a restrained developer. The theory is that by moderate over-exposure the density of the high lights is reduced and the details brought out in the shadows, and the proper development preserves a suitable balance in the negative.

The ideal day for outdoor flower-photography is one in which the sky is overcast with fleecy clouds, or one with what is known as "hazy sun." There may be good work done, with care, on very dark, cloudy days, though there is a lack of snap where the light is so much reduced and diffused that no shadows are cast. Of course, a heavy wind destroys any possibility of success, though even on windy days there are often lulls which will permit of successful exposures, I have memories of long waits, however, with no results save vexation! On Long Island the wind blows and blows, as I found out after waiting bulb in hand for a long half hour, the lens focused on a beautiful clethra. In despair, at last, I made the exposure, and lost a plate, of course.

Illumination.

The direction of the light is of much importance. Photographing against the sun, in a diffused light, often gives charming effects; but if detail is wanted, don't do it! All the light tones of flowers are so very much lighter than the foliage, and reflect so much more light, that the chief difficulty is to get detail in the foliage without over-exposing the flowers. If to this trouble is added the further difficulty of having the foliage in shadow, it is likely to be represented in the negative principally by clear glass, which is another name for "mud" in a picture. Therefore, if detail is wanted, and it usually is, we must photograph with the sun at our backs, or somewhat to right or left. This is necessary also on cloudy days, when the sun casts no apparent shadow, for even on such a day we will soon discover that the preponderance of light is strongly from the direction of the luminary whose actinic rays must do our painting for us. And if we are working in natural surroundings, the great importance of the direction of the light must not be overlooked.

I have several times endeavored, owing to the conditions, to photograph specimen coniferous evergreens—pines, hemlocks, and the like—against the light, on cloudy days, giving very long exposures to compensate for the wrong direction. The failures were uniform, and I was further convinced that to secure detail in green foliage, the light must be shining right *into* the side photographed.

The middle hours of the day are not good for this work. Then the top light is especially strong, over-illuminating the flowers, and tending toward harsh high-light spots on the upper leaves, with correspondingly dense shadows below. The early morning hours are especially good; I have made successful rose pictures while the dew-drops were yet resting on the petals of the rose, just before sunrise. The long evening light is also very favorable, though much slower. Another important point is that even in windy weather there is usually a hush in the morning, and again in the evening, during which delicate flowers and foliage which have been tetering in a tantalizing manner all the day, may be caught napping. Indeed, it is worth much preparation and sacrifice to arrange for undisturbed opportunity, especially during the hours of daylight before ten o'clock in the morning. Many times have I had good reason to deeply regret the precious moments wasted on breakfast and courtesy, while the beautiful morning light was fleeting and the wind was rising to vex me!

Zephyrs.

That matter of wind — it is a vexing one! Often a zephyr so gentle that it utterly fails to fan the perspiring forehead of the photographer is sufficient to keep up a continual movement of the delicately poised flower cluster he is after. He will think of using the focusing cloth as a wind-break, perhaps, and will then discover that the offending breeze seems to come from nowhere, for he can't shut it off! The only thing to do is to wait for the quiet moment; and when the patience is all gone, and the temptation is to make an exposure anyway, in despair, *don't!* Keep on waiting! Better one good negative in a half-day than a half-dozen bringing the regretful thought, "It *might* have been!"

Practical Work.

Now, we have had enough preparation, surely — let us sally forth with camera and tripod, plates and lens, on a cloudy day in early spring. We think of the beauties of the apple-blossoms, and we resolve that the apple-blossom picture shall be ours. We come to the old orchard, and are at once amazed at the wealth of material. We are wanting pictures of the blossoms, not of the trees, which, when reduced to the limits of our plates, are a mere blotch of white, perhaps against a sky that is also white, actinically, at least. We consequently avoid the mass, and find a projecting branch at the edge of the orchard, which we can bring on the ground-glass so that it will *not* have other blossom-laden twigs as a background. We consider the exquisite cups of pink and white, and perhaps we break the rule of photographing with the light, for the sake of the shadows we can get in the flowers, giving them modeling and form. Perhaps a figure is introduced (never with face toward the camera), and a picture breathing of spring is on the ground-glass. The light is quick; we stop down to *f*/22, wait the still instant, give an exposure of perhaps one-third of a second, and we ought to be happy upon development!

The apple-blossom is a "tame" flower, and we want to photograph those termed "wild." Just about the blossom time we hear of a great display of the "wake-robin," *Trillium grandiflorum*, on a rocky hillside. Thither we journey, and the sight is gorgeous, for the whole hillside is dotted with the delicate, but large, white and pink blossoms. Here is a different problem, for the tallest plant is not 12 inches high, and our tripod stands full 50 inches. We slide in one joint of it all around, spread out widely, throw one leg up almost horizontally against the hillside, tip the camera down, and have the flowers before us. How thankful we are that there are none of man's rigid vertical lines to make apparent the dip from the horizontal of the ground-glass! Now it appears that we don't get any one of the trilliums full in the face, and we proceed to aid nature by tenderly transplanting two or three into eligible locations, carefully arranging them so as to "look natural." A satisfactory view results, and with a much longer exposure to compensate for the trees which surround us, we press the bulb, and the trilliums live again upon development.

Again, later in the year, we strike a glorious mass of the small "soft sunflower," *Helianthus mollis*. Bright yellow and orange, and dark centres; the ray-filter is needed; we point at the centre of the plant, await the momentary cloud, and a "quick bulb" exposure is enough.

We are entranced at the exquisite flowers of several of the native orchids, *Cypripedium pubescens*, in rich yellow, and *C. acaule* in deep pink. Long we labor to get the plants and camera in harmony, but only failure results, because the habit of the genus being to locate in isolated clumps amid other low-growing plants, it is well nigh impossible to get a background which will contrast safely with the flowers. Later, we find the way out of such troubles by gently transferring the plants to a suitable place in front of a stump or a large rock, and we are happy!

But there is no need to multiply examples, for he who, with blood stirring with the opening of spring, takes his camera and gets "close to Nature's heart" in the search for pictures of her fairest children, will need no directions — his greatest need will be time, time! He will count lost, as I do, that photographic day which he must spend at his work earning a living, and he will get health and enlargement of soul, and many pleasing reminders for the winter days, from those days when his nature sense takes him afield in spite of desk or shop, or even the telling about his "hobby," which I would drop right now with much joy to essay another time at the spring flowers!

Photographing Trees.

The photographing of trees is connected closely with outdoor flower work, and may be taken up to great advantage by those who get into touch with the dainty blossoms of the field. Indeed, the two sections intermingle, for some of the most beautiful flowers to photograph grow on trees, and to get them in the natural situation, the tree must be considered.

Tree photography is also intertwined with landscape work, though with this difference, that while in the latter the tree is merely a means to an end, an incidental part of the composition, in the former it is the main object, and to be pursued with landscape accessories only.

Decorative Forms.

There is, too, much to be gained by a study of tree forms, or more especially, twig and branch forms, in connection with their decorative value. The wide-awake photographer who once realizes the beauty and individuality of trees and shrubs in their leafless condition, when every twig is traced against the sky, will never complain that winter shuts off his work and pleasure. Indeed, many careful workers are of the opinion that the winter garb of the trees is far more interesting. Many valuable suggestions concerning "Decorative Natural Forms" may be found in the articles under this title, by Henry Irving, in *The Photogram*, 1899.

There are many charming effects within reach of the enthusiast who shoulders his camera on a snowy winter's day. The varied play of the light on the trunks and twigs, as one looks at the tree's form, against, or quartering to the sun, is most interesting, especially when considered with relation to the sky and cloud values.

Extreme nicety in exposure will help immensely in obtaining satisfactory results.

For this outdoor tree work the outfit previously recommended, as to camera and tripod, will suffice. The wide-angle lens, too, is again most useful; for we want our main object, the tree or shrub or bush, largest, with the landscape diminishing in size and importance. In this case, then, the chief objection to the wide-angle lens for landscape work becomes its main virtue.

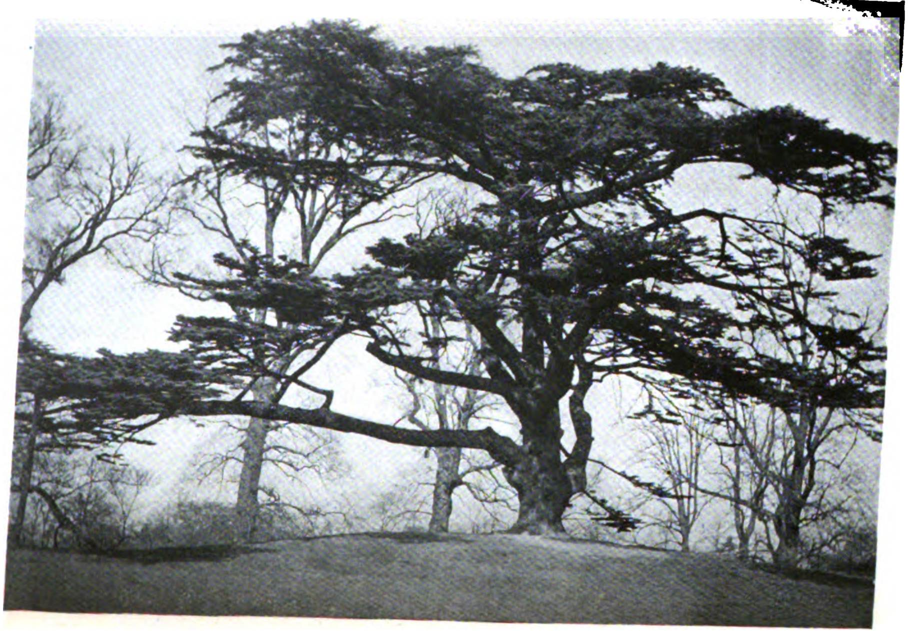
Isochromatic plates are an advantage, because in the summer's work we have many shades of yellow and green to deal with. A ray-filter will help very strongly, when there are clouds in the sky; and usually the lengthened exposure will be no detriment.

Wind. In summer tree photography the main trouble is from the wind. Leaves are delicately hung, and often the perspiring worker on the ground, waiting in impatience for the "going in the tree-tops" to cease, wonders where the twigs find the zephyrs which persistently fan them while missing his dripping forehead! It is a question of waiting, often; but it is worth noting that there is almost always a settling down, a lull, *after* a sharp blow of a moment or so. Wait on this, bulb in hand, quick plate ready, and you may get the fraction of second's stillness which is needed.

Exposure. The question of exposure is totally dependent upon the objects and the light, of course, but one thing may be noted, and that is, that deep green trees, nearby, take two to three times the exposure of an open landscape; and they are also far better rendered upon a non-halation or "backed" plate. Another thing, previously mentioned in these pages, but again emphasized now, is the absolute necessity of working upon heavy foliage masses or deep evergreen trees with the light streaming upon the main object. No length of exposure will compensate for the wrong direction, and the negative made against the light, with a great pine as a principal point, will be a failure. Of course, I must not by this be understood to argue against evening views, sunsets and the like, with trees between the camera and the light. Such views, often delightful, are *not* primarily tree pictures, and my point holds.

In photographing for tree features, however, the landscape need not be neglected, and a main necessity for an agreeable result is the proper balancing of the composition. Often an apparently irrelevant object will be just

OAK LEAF
G. H. Woolfall



A CEDAR

the thing to enforce the value of the main feature. In this, as in all other photographic work, intelligent, and not arbitrary or didactic art training, is of enormous value, and constant study of the conditions, without exposing plates, will tend toward continuous success when exposures are made.

Trees in blossom are delightful to look at, and not easy to photograph. The apple blossom melts so easily and indistinguishably into the white sky! Here again comes into play judgment and a ray-filter, clouds and the right direction.

Fruit trees in fruit are almost hopeless. The brilliant red cherry is, alas, a flat black photographically. Separate twigs of berry-bearing fruits, however, are often charmingly photographed in the studio, with decorative intent. Occasionally one can find a branch of a fruiting tree in such position as to get it against the sky, and then a good thing may result.

The four branches of our subject, treated in the foregoing pages, are intimately interwoven, and I can only hope that the hints presented may smooth the path of some nature-lovers who may take up the delightful work.

Reproducing the Colors. Despite the attractiveness of flower and tree photographs in monochrome, it goes without saying that the capabilities of photography in this direction would be enormously enhanced if the colors, as well as the form, texture and gradation of light and shade could be reproduced as the eye sees them. The mere tinting of monochrome photographs will never satisfy the eye, even for decorative purposes, because the peculiar delicacy, richness and translucency of flower coloring are utterly lost in the underlying monochrome. The only practically available methods of photographic reproduction are the tri-chromatic processes, and of these, as sufficiently simple for the amateur, the Ives' Krōmskōp system, now being made commercially possible, deserves appreciative mention. The tri-chromatic printing methods on paper are far too complicated and costly for the amateur to attempt their practice, nor have they yet proved conspicuously successful in reproductions from nature. The Krōmskōp system does not produce color prints, it being necessary to blend the color elements by optical means; but with this limitation, it yields results which seem almost mirrored reflections of the objects themselves, and undoubtedly represent the highest achievement in photographic reproduction.

The Krōmskōp system is too new to the American public, and its practice has been too limited to permit of going into the subject here as fully as it deserves. Suffice it to say that there are already some enthusiastic Krōmskōpists, who declare that monochromatic photography has quite lost its charm for them since they have been able to reproduce the colors of their flower subjects together with their forms and light and shade effects.

The Joly and McDonough color reproduction methods will also be recalled by the reader as possessing peculiar advantages in the photography of flowers and foliage.

Acknowledgment. It will interest the reader to know that this little book was prepared by Mr. J. Horace McFarland, whose photographs of flowers are well known to those engaged in this branch of photography. The information given is based upon his personal experience, as well as his knowledge of the methods employed by other workers in this specialty. The pictures, which so charmingly illustrate his arguments, have been chosen from many examples sent by expert workers, and their willing help is hereby most cordially acknowledged. Mr. G. H. Woolfall, an English specialist in tree photography, sent with the two illustrations credited to him, an interesting account of his methods of working, from which several useful suggestions have been embodied in the last few pages. As this number of The Photo-Miniature is the only work on the subject, we cannot refer the student, as usual, to other sources of information.

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NOTES

Considering the increased attention given by amateurs of late years to the photographic possibilities of street-life and urban scenes, it is surprising that, as yet, no one has put out a guide to this interesting branch of photographic work. The next number of THE PHOTO-MINIATURE, which will be ready within a fortnight, will include a practical handbook on "Street Photography," embodying all the information needed for successful work, and illustrated with some capital examples of how it should be done. The information it gives will be equally applicable to work in big and little towns, at home and abroad, the writer of the monograph going very fully into his subject. Unless we are mistaken, the number will prove to be one of the most popular of THE PHOTO-MINIATURE series, and readers will do well to place an order with their dealers as early as possible.

❧

The reprints of Nos. 1, 2, 3, 4 and 6 of THE PHOTO-MINIATURE are selling almost as quickly as when they appeared in their first editions. The second edition of No. 7 is expected from the printers in a few days. A list of all the numbers of THE PHOTO-MINIATURE thus far published is invariably given on the page facing inside front cover in each issue.

❧

The June number of *The Photo-Beacon* is received, with 56 engravings from the pictures exhibited at the late Chicago Salon, and a "breezy" review by the editor, Mr. F. Dundas Todd. This is, in every way, the best issue of *The Photo-Beacon* Mr. Todd has published, and picture lovers should make sure of a copy before the edition is exhausted. (*The Photo-Beacon Co.*, Tribune Bldg., Chicago. Ten cents.)

❧

Talking a few days ago with Mr. F. M. Frobisher, an expert New York amateur, we learned that Mr. Frobisher, after testing all the newer developers, has gone

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back to pyro as the developer *par excellence* for cartridge films. The examples we saw confirmed Mr. Frobisher's decision in the matter. His negatives were of beautiful printing color and quality, free from grayness and veiling, and unusually sparkling for hand-camera exposures made under varying conditions. His developer is made up as follows: I. Water, 12 ounces; sodium sulphite, 3 ounces (if "dry," 1½ ounces); ammonium bromide, 20 grains; citric acid, 60 grains; sulphuric acid, 1 ounce; pyro, 1 ounce. II. Water, 12 ounces; sodium carbonate, 4 ounces (if "dry," 1 ounce, 4 drams, 48 grains). For use with normal exposure, take 1 dram each of I and II, and add 2 ounces of water. Mr. Frobisher avers that this developer will stain neither fingers nor plate, and keeps well. We have not tried it, but the formula looks like a good one, and the amount of "preservatives" included should ensure both clearness and keeping quality.

◆

There are at least *two* awkward blunders in THE PHOTO-MINIATURE No. 11: *Developers and Development*, which readers should correct on the margins of their copies, as follows: In the *Lovell* pyro-metol formula given on page 555, add ¼ ounce of metol to No. 1 solution. In the *Imperial Standard* formula, given on page 556, add 45 grains of metol to No. 1 solution. How such unspeakable blunders could occur under the eye of so careful an editor as THE PHOTO-MINIATURE retains, is one of those things which he himself cannot understand, and, therefore, cannot explain! Mr. Henry Wenzel also writes to point out that in the instructions concerning the use of his *orto-metol* formula, given on page 557, that in cases of under-exposure *diluted* developer is advantageous, and not the *un*diluted solution as there mentioned, which is a matter of opinion and depends upon the quality desired in the negative.

◆

The fourth annual convention of the New England Photographers' Association is to be held at Boston, September 12 to 14, inclusive. Demonstrations in lighting and posing according to modern methods are among the features already arranged, and great efforts are making to ensure a pleasant and profitable meeting.

◆

The May number of *Anthony's Photographic Bulletin* contains two papers worthy of preservation for reference.

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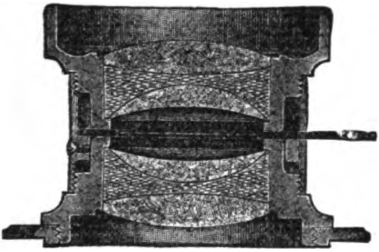

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"Some Developers Compared: Experiments and Results," illustrated by F. C. Lambert, and "The Washing of Negatives," by J. Gaedicke.

◆

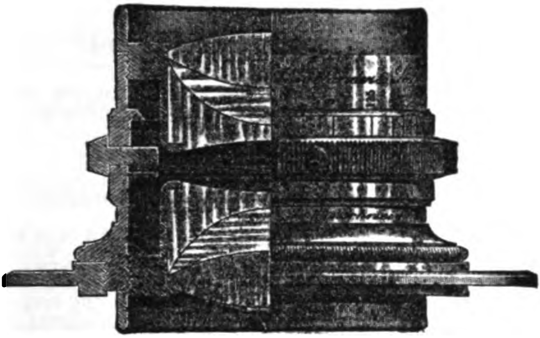
The Savannah (Ga.) Camera Club is busy with the gum-bichromate method. Mr. Percy Sugden recently gave a demonstration of the process before the members of the club, and his display of its comparative simplicity has awakened much enthusiasm in its practice. There is so much that is peculiar about the gum-bichromate print that we cannot forbear expressing the hope that the results of Mr. Sugden's work in Savannah may not prove fatal. The Savannah club is a thriving little institution, and under the able leadership of Mr. Ben. J. Apple, promises to be of great usefulness in the photographic life of its city.

◆

The last number of *Photography* received gives the subjoined method of making a portrait by lamplight, such as the one given opposite page 381 in THE PHOTO-MINIATURE No. 8: *Photography at Home*. The method is due to Mr. Ainsley, whose work has had much commendation. The subject was a gentleman, seated at a table, pen in hand, apparently reading a letter. By his side was a standard lamp with a cardboard shade, white inside, and green out, of the usual conical shape. The lamp was alight, although its flame could not be directly seen on account of the shade. Two lengths of magnesium ribbon, each of four inches, were also suspended underneath the shade. Everything being got ready, and the lens uncapped, the magnesium ribbon was ignited. A properly exposed picture resulted, the room truthfully shown in the gloom which it would present when lit by one shaded lamp only, and the face and figure very clearly illuminated from the lamp, and not, as is so often seen, from some very obviously extraneous source. We would suggest this class of work as one in which there still remains a great deal to be done which shall present features of novelty, such as most landscape and figure work is now without. The same issue of *Photography* (May 17) also contains an attractively illustrated article on "Flower Photography," by Mrs. Caleb Keene.

◆

That photographers have no right to use the negatives of their sitters, or exhibit prints therefrom without the



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sitter s consent, has again been decided at the Westminister (London) County Court. It is, of course, indisputable that the negative made by a photographer is his property; but it does not follow from this that he may use the negative as he desires, if it oe a portrait of another person, without the individual's permission.

◆

Readers who are planning a trip to the Paris Exposition may find the following notes useful. They are extracted from a paper on "Photography at the Exposition," by Mons. Mareschal, in the *Photo-Gazette*. As already published, hand-cameras, *i. e.*, any camera which can be manipulated in the hands, regardless of its size, may be used in and about the exposition at any time without charge. Stand-cameras are admitted only on payment of a fee of 25 francs, the permit being obtained from the Administration Department. (Quai d'Orsay, near the Point d'Alma.) This permits the bearer to photograph until 1 P. M.

Those who use a camera without a stand are free to work from morning to night. These will do well to provide themselves with a hand-camera provided with a rising front and a lens embracing a tolerably wide angle, for many of the monuments, etc., in the exhibition are so placed that the photographer must take them, if at all, at comparatively short range. La Rue des Nations, which presents some of the most interesting features, runs almost exactly from east to west. It will therefore get the sun in the morning and evening; but, as it is almost straight and planted with large trees, it will be almost impossible to make instantaneous views in it. The photographer will find things better arranged for him in the palaces on the north side, the main façades of which point towards the Seine. The whole of them can thus be taken in the morning from the Pont des Invalides, a lens of long focus being advisedly employed. More detailed views will also be obtainable early in the morning. Le Palais de la Belgique, which is one of the most notable and which represents the Hôtel-de-ville d'Audernarde, can be obtained by means of a good rise of front. Le Palais de la Hongrie is likewise of great interest, but only part of it can be obtained at a single exposure, as other buildings intercept the view. Those who dislike rising early in the morning can obtain a good view of these palaces from the Pont de l'Alma close on sunset, but they should not attempt le Palais Belgique, the main façade of which will then be illuminated from behind. All the

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right bank of the Seine, being due south, will be easy to photograph. The parts to be specially noted are Old Paris and the Palais de la Ville de Paris. On the Esplanades des Invalides, the principal artery of which runs almost exactly from north to south, it will be difficult to get a lighting other than one which gives one side sunshine and the other shadow. If the best time is to be taken advantage of—about noon—turn the back on the Dôme des Invalides, and secure a diffused lighting rather than sunshine. Behind the principal galleries of the Esplanade will be found many interesting features: to the east, les Mas Provençal, la Maison Bretonne, etc.; to the west the various foreign buildings will be found to present difficulties in photographing.

Le Pont Alexandre can be taken from various points along the left bank of the river. The front of the bridge, on the side of the Champs Elysées, can be taken at any time. The statues and decorative work make it a most interesting subject; to include these, the camera should be placed on one side of one of the footways. The two palaces on the Champs Elysées stand behind it. The larger is well lighted up to midday, the smaller all the afternoon.

The position of the Champ de Mars is southeast and northwest; good lighting can therefore be obtained at almost any time, but in sunshine the waterworks in the background do not come out well; for these diffused light should be chosen.

Le Trocadéro will be fully lighted most of the day, and by taking one's stand in the central roadway the different construction of the two sides can be obtained. Russia stands out prominently, and behind it, by the left wing of the Palace, is China, where, with a wide-angle lens, an excellent view is obtained.

It is obvious that, as almost all the buildings at the exposition are largely composed of "staff" or plaster, backed or nonhalation plates will be advantageous. A few orthochromatic plates will also be found useful, as, in some cases, the interiors fairly glow with color.

◆

According to the *British Journal of Photography*, the English photographic societies could only exist with difficulty were they deprived of the help and interest they derive from lantern exhibitions, and demonstrations of trade novelties given by manufacturers. This may account for the moribund condition of so many of our American societies, for here the lantern is by no means

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as popular a society feature as in England, nor have American manufacturers yet appreciated the society meetings as a valuable means of publicity for their goods.

◆

The *Luxia* platinum papers, just introduced in England, in print-out and development varieties, are said to "possess remarkable keeping qualities, and require no more care than silver papers, being packed and stored in the same way, the use of calcium tubes, etc., being unnecessary."

◆

The one man exhibition at the Royal Photographic Society's rooms during May presented a collection of architectural and interior photographs by Mr. F. H. Evans. The exhibition now open consists of a large number of photographs by Dr. P. H. Emerson.

◆

The United States National Academy of Sciences, says *Nature*, has decided to award the Barnard medal to Professor Röntgen for his discovery of the X-rays. This medal is awarded every few years for noteworthy discoveries in physical and astronomical science.

◆

"Touchstone," whose fortnightly philosophy gives a touch of lightness now and again to the somewhat pedantic pages of the English *Amateur Photographer*, discourses in a recent issue upon "Reputations." We extract:

You will appreciate that the reputation of many depends to a great extent on mystery. Now, as every cook and chemist will tell you, this is a most important ingredient in almost every concoction, and reputations are generally concoctions. It gives excitement to the new developer, and piquancy to the humble sausage, and it will go a long way to do everything but wash clothes. I know a man—a great man—at least, he knows me sometimes when he's particularly affable—and he has a great reputation. The other day someone said to someone else, who knows most things, and a bit more, "Who is So-and so?" (the man with the reputation). "What does he do? Where does he live, and who's his tailor?" "My dear boy," was the answer, "don't ask—don't want to know—his mystery is his charm. If it were known who he was and when he was married, and that

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he went to the city every morning, and lived in Peckham, all his delightful attraction would be gone." So you see if you, metaphorically speaking, mark a burnt cork moustache on your face, and button your coat at the back, people will wonder what it means, and you'll probably very soon have a reputation—or get run in.

There are heaps of men nowadays that are making reputations. Mr. J. T. Keiley, in the New York *Camera Notes*, has been piling up bricks, and shying some as well, but to some of us it seems as though his reputation would have a better chance if he stuck to writing, and didn't show his works. Now, that discretion is most marked in some men. They write ten or twelve pages of criticism every October, and tell us all our sins of omission and commission, and send copies free gratis to all our friends, and publish little line drawings of what we've done, and where we've erred, and we look upon them as heaven-sent critics, and their reputation goes up to 90° in the shade, and no shade available. And there it stands, because they don't run any risks by showing us how to do it, and how they do it in their own work. When you are backing "Precept" to win it's a great mistake to run "Example" in the same race, for it might just manage to give its stable-companion away, and then the crowd would shout!

◆

Mr. Basil Williams, in a paper read before the London Camera Club a few weeks ago, gave many interesting notes upon photography in Persia. During the trip Mr. Williams succeeded, among other things, in obtaining several pictures of harem life, a feat which has hitherto been regarded as a practical impossibility on account of the jealousy with which the Easterners guard their home life.

◆

Here is a plate-backing mixture which will do all that the more complicated caramel mixtures will do, and which is much easier to prepare. Dissolve a 4-ounce stick of licorice in 8 ounces of water with the aid of gentle heat. When dissolved, rub into the mixture 1 ounce of burnt sienna in powder, using the back of a spoon for this purpose. When cold, bottle for use.

◆

A new Zeiss anastigmat, named the *Unar*, is announced. It is a non-symmetrical objective, each combination being composed of two single lenses, uncemented. According

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5	7½	6½ x 4¾	7½ x 5	10 x 8	25
6	9	7½ x 5	8½ x 6½	12 x 10	29
7	11	8½ x 6½	10 x 8	13 x 11	39
8	13	10 x 8	12 x 10	15 x 12	51
9	15	12 x 10	15 x 12	18 x 16	65
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◆

According to all accounts received, the recent solar eclipse occurred under photographically perfect conditions, and we may look for many interesting records when the astronomers have had time to develop their plates. Mr. Nevil Maskelyne, of London, who accompanied the British Astronomical Society's party to Wadesboro, N. C., was successful in his attempt to record the eclipse with his kinematograph, and it is probable that many interesting things will be learned of the results he secured.

◆

"Five hundred negatives in five days" is the record of the *Tella* hand-camera in the hands of Mr. E. Dunmore, an English photographer. If only Mr. Dunmore would give us a bill of particulars, what an experience would be laid bare; how many good negatives; how many failures, etc.

◆

Under the title *Lloyd's Photographic Encyclopedia*, 1900, Andrew J. Lloyd & Co., Boston, have just issued a comprehensive catalogue of their photographic specialties, which is, in many ways, an excellent reference book of photography. In its almost 400 pages are described and illustrated all the requisites and conveniences used in modern photography, and together with this information are included several useful papers on photographic practice, and a capital guide to photography from the amateur standpoint. Among the papers mentioned is one on "The Renaissance of Artistic Photography in America," by A. Horsley Hinton, and another on "Flash-light Photography," by F. Dundas Todd. Dr. John Nicol writes upon "The Use and Abuse of the Hand-camera;" H. Snowden Ward and George E. Brown deal with "Instantaneous Photography" in a more than usually interesting paper well illustrated. The book is one which offers a remarkable amount of information in a very attractive way, and the price (twenty cents) puts it within the reach of all.

◆

The British Journal of Photography, commenting upon the ridiculous figures of men and women forming

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the illustrations in journals devoted to fashions, asks: "Why do not our fashion papers use photographs from life to display the attractiveness of this or that new style of dress?" It may be worth noting that this has been the custom for some years in our American fashion journals, which, indeed, rarely use other than direct photographs from life. The advantages of the American method are strikingly apparent upon a comparison of European and American journals of this class.

◆

Voigtlaender & Son, the well-known lens makers of Brunswick, have just introduced a new portrait lens which works at *f*/2.3. It is further said that the new objective is mounted in a new alloy of magnesium and aluminum, called magnalium, the invention of Dr. Ludwig Mach.

◆

Phosphate of silver collodion emulsion papers are being discussed in several of our contemporaries. The subject seems to have been brought forward by the published account of the process of Dr. Meyer, of Brooklyn, described in a recent issue of the *Photographic Times*. A number of prints by Dr. Meyer, on paper and fabrics, was shown at the exhibition of the American Institute at New York in 1898. In the May number of *Photographische Correspondenz*, Professor Valenta describes his experiments with the process, and traces its evolution back to 1839, when Fife first mentioned his attempts to prepare a photographic printing paper with phosphate of silver. Properly prepared, Valenta says that phosphate papers print fairly quickly, may be developed, after brief exposure, with pyrocatechin or hydroquinone, and yield prints similar to our familiar silver-chloride papers.

◆

Pyrogallol ("pyro") has been placed on the English market in a solid form, fine white crystals, under the name *Pyraxe*. An ounce of *Pyraxe* occupies a one-ounce bottle, whereas in the old flocculent form an ounce of pyro usually requires a bottle or tin of six or eight ounces capacity.

◆

At the last meeting of the L. and P. Association, Mr. R. P. Drage, in answer to an inquiry, gave some of his experiences with films in hot climates, such as one had to go through in a tour round the world. He found that in

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such cases the latent image was practically falling off from the moment after exposure. Films that would keep a long time before exposure soon began to deteriorate in the sense that the light effects did not last, although he had found that, given a sufficiently long time after exposure, the film could be again exposed without much fear of the former image asserting itself. The emulsion, it would thus appear, was still good, but its power to retain the latent image was very slight. Under similar circumstances, he should certainly develop films within a short time of their exposure.

Mr. A. Haddon reminded the members of the difference between cut films and rollable films. The former were coated on celluloid sliced from a block, and the latter coated on glass. Much trouble arose from imperfect washing of the pyroxyline. Some time back he went through a smokeless-powder factory. Smokeless powder was made from sawdust, which, after being nitrated, takes a fortnight to wash, and during that time it is washed continuously with hot water and cold water again and again. The whole object of the treatment is to get rid of the merest trace of acid, which would be fatal to the success of after-processes. He was quite sure that no user of pyroxyline for photographic film purposes went to this trouble—it was too expensive—and the chief trouble with cut films was due to the presence of this acid and the decomposition it set up. Absorbent cotton used for making the pyroxyline consisted really of a series of minute tubes, and the amount of washing required to clear these of the acid was immense. In the rollable film, where, of course, the same state of things might originally exist, the solvents used tend themselves to remove by decomposition that which, left in the other film causes its early deterioration.

◆

Watkin's Exposure Meter has been issued in a new and improved form, considerably reduced in size and weight, and more convenient to handle. Wynne's Meter has also been issued in the form of a locket, and the scales are arranged around the periphery of the instrument. These improvements will doubtless tend to the greater popularity of these aids to correct exposure. The American agents for both meters are Messrs. E. & H. T. Anthony & Co., of New York.

◆

The Photographic Times of New York shows considerable improvement month by month under its new edi-

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tor, Mr. J. C. Abel. The last number received contains an appreciation of Mr. Joseph T. Keiley, and his work is shown in several excellent reproductions in photogravure and half-tone. The "Monthly Digest," giving extracts from articles and papers of current interest in other journals, is an attractive feature of the *Times*, and the original contributions cover a useful variety of subjects.

❧

The Photo Clipper is a new monthly magazine, edited by Felix Raymer and published at Effingham, Ill., at $1 per year. Mr. Raymer has made his name a household word among American professional photographers by his practical articles on posing, lighting, etc., and we doubt not that his little journal will receive the welcome it deserves. The numbers thus far published offer much carefully selected information, original and "extracted."

❧

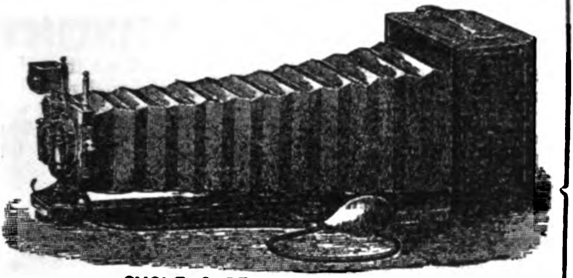
An excellent ray-filter at a reasonable price is the *Ideal*, introduced by Burke & James, of Chicago. It is light in construction, may be fitted to several lenses, and the tinted glass is so chosen as to yield good results with the average subject. The glasses are optically worked, and cemented together like an achromatic lens. For any subject containing color, such as flowers, clouds, etc., the *Ideal* will be found to be a practical help.

❧

In the last number of *Camera Notes*, "A. Smiler's" satirical papers concerning "The Keeley Cure" and "The Transcendentalists"—which have recently given amusement to those interested in the renaissance of pictorial photography in America—are reprinted. At the end of the reprint the editors of *Camera Notes* impute the authorship of the papers to Mr. F. Dundas Todd, of *The Photo-Beacon*, with a second guess at Mr. Thomas Harrison Cummings, of *The Photo-Era*. To those familiar with the identity of "A. Smiler," these guesses are absurdly stupid, and we look with interest to their repudiation by the two innocents impeached.

❧

According to Dame Rumor, the editorial broadside touching "The American School" in the last issue of *The Photo-Era*, was not written by the editor of that journal, but by some one "on the outside." And rumor further whispers to the breeze that the broadside, as pub-



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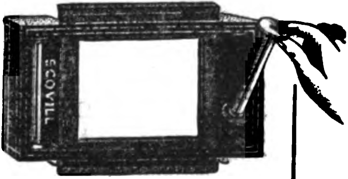

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lished, has been considerably blue-pencilled, so that the strong points were eliminated and only the wishy-washy portions permitted to pass. This is deplorable. But we are credibly informed that Mr. Keiley has a rod in pickle for the Smiler family, and to mix the metaphor, will let loose his thunder in the annuals.

◆

Instruction in Photography. By Sir W. de W. Abney. Tenth edition. 502 pp., with many illustrations. Cloth, 5 x 7 x 1½ in. London: Sampson Low, Marston & Co.

For those photographers who want to know the reasons of things rather than a superficial knowledge of photographic practice, Abney's *Instruction* is undoubtedly the best photographic text-book in the language. Its merit, however, lies not only in its thoroughness and reliability, but also in the fulness with which the various processes of photography are treated. The new edition embraces all the latest researches in optics, chemistry and photo-mechanical work, while the chapters devoted to emulsion-making and manipulation have been revised to harmonize with the theories and practice of today. The illustrations are much more numerous than in previous editions and add largely to the value of the work as a practical manual for the student.

◆

An interesting article upon "Artistic Photography in Portraiture," by Maud Burnside, appears in the June number of *Brush and Pencil* (Chicago). It is illustrated with several examples of pictorial portraiture by Elizabeth Flint Wade and Rose Clark.

◆

The *Photo-Beacon Company*, Chicago, has published a *Souvenir of the Chicago Photographic Salon, 1900*, giving one print from each exhibitor's work at the Salon (except in three instances) in the form of half-tone engravings carefully printed on coated paper and enclosed in a tasteful cover. As the first complete record of what is admitted to have been the most representative exhibition of American photography held thus far, this *Souvenir* should find a place in the sanctum of every worker interested in the progress of pictorial photography. The price, we believe, is 50 cents.

◆

Dr. Chas. F. Himes, writing to the *News* concerning the keeping qualities of dry plates, says: In the spring

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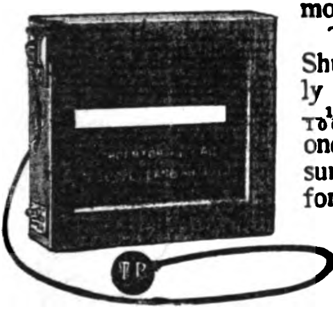

The Focal Plane Shutter for extremely high speed ($\frac{1}{90}$ to $\frac{1}{1000}$ part of a second) is the simplest, surest shutter made for this purpose. It is with this shutter that the best pictures of athletic contests, races, hunting scenes, etc., are made.

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of 1884 several gross of 4 x 5 dry plates were sent me by different makers. The plates in excess of the immediate purpose for which they were furnished were stored away, in the wooden cases in which they had been received, in a dry room on the first floor of a building. After five or six years they were drawn upon from time to time to test their working qualities. The last test was made in 1898. They have always afforded clear, vigorous negatives, not appreciably different in any respect from those first given. As to their rapidity or sensitiveness, there are not precise data for comparision; but there is, at least, no very manifest difference, if any, from that of fifteen years before. Two dozen of these plates, of two different makers, in the original packages, have been recently placed in possession each of the Philadelphia Photographic Society and of the photographic section of the Franklin Institute of Philadelphia. Their report upon them may be anticipated with some interest.

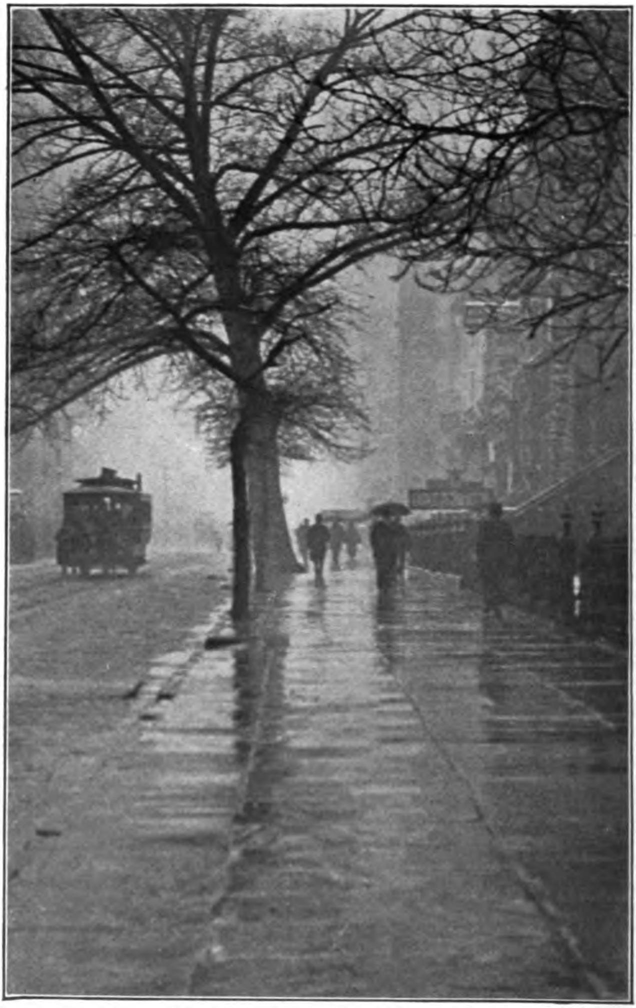
◆

Photography: its History. Processes, Apparatus and Materials, comprising working details of all the more important methods. By A. Brothers. With plates by many of the processes described and many illustrations in the text. Second edition, revised, 367 pp., 6¼ x 9¼ x 1¼ in., $6. Philadelphia: J. B. Lippincott Company.

We are glad to see that a second edition has been demanded of this standard reference book, which we have used with considerable satisfaction since the appearance of the first edition in 1891. Mr. Brothers was among the pioneers in English photography, and the book is enriched by his practical experience with many of the processes he describes. A portion of the volume is necessarily occupied by historical matter, but this has its uses to the student, and the need of some authoritative guide to names, dates and reliable data amply justifies the author in writing the work from this standpoint.

◆

A bargain list and catalogue, which can best be described as remarkable both in its completeness of description and illustration, has just been issued by Ralph J. Golsen, 82 Wabash avenue, Chicago. The curious can obtain a copy by writing to Mr. Golsen for a copy of List No. 13.



WET, FOGGY DAY: NEW YORK
John Beeby

THE PHOTO-MINIATURE
A Magazine of Photographic Information
EDITED BY JOHN A. TENNANT

Vol. II MAY, 1900 No. 14

STREET PHOTOGRAPHY.

In the beginning, amateur photography was by no means the simple art with which we of today are more or less familiar. Truth to tell, it was a somewhat tiresome sport at best, and its following called for many virtues, such as quiet patience and indomitable perseverance, which are now quite out of fashion save among fishermen and simple souls. When our photographic forefathers determined upon a day outdoors with the camera, they exercised themselves much as we do when we set out in pursuit of big game. Weather probabilities were consulted, apparatus overhauled, packed and repacked; at break of day a move was made to a secluded spot in the country; a deserted mill, or rustic bridge over some babbling brook, was carefully chosen as a subject worthy of the occasion, and exposures were made with as much deliberation as is given now-a-days to the making of one's will.

The hand-camera, the modern lens, and the rapid plate or roller film have changed all that. We are very much advanced. Mechanical difficulties have been cleared away, processes simplified down to the smallest detail, and the field of practicable subjects has been extended from the deserted mill to the very eclipse of that giant orb on whose beneficence all photography depends. With this evolution of the process there has been a corresponding evolution of the point of view. The amateur of today begins with the exaggerated idea that with a camera all things are possible. Blissful ignorance! After the first few attempts, he awakens to the fact that, apart from the perfection of the process, the average man has his limitations. Later, he reaches the wise conclusion that in photography, as in other things, specialized knowledge and experience are necessary to bridge the gap between expectation and realization;

and here he touches elbows with the amateur of half a century ago.

Especially are these things made plain when the amateur essays to record, what to him is far more interesting than deserted mills or rustic bridges, i. e., the everyday life of the streets of his city, or of foreign cities when traveling abroad. The desire to perpetuate these things naturally comes with, if it does not precede, the possession of a camera; and the growing tendency in modern photography to depict the humor and pathos of life, as we see it in our city streets, rather than the beautiful in nature remote from man, is one of its happiest phases.

But street photography has its peculiar difficulties as well as its peculiar pleasures, and oftentimes the lack of knowledge on just a few points will spoil for permanent enjoyment what would otherwise have been a delightful memento of this or that scene or incident. To set forth these difficulties and how to remedy them—to gather into one place the things a man should know before he takes up street photography as a hobby—is the plain purpose of this little book. It should be read, therefore, as supplementary to those earlier numbers of THE PHOTO-MINIATURE which deal with *Hand-Camera Work* and *Photography Outdoors*.

Picture Material.

Foremost among the attractions of street photography is the fact that we do not have to travel, or wait for rare opportunity, to find our picture material. It is right at our doors, in our own town, if we know how, and when, and where to find it. And the man with a cheap box-camera, possessing wisdom with it, has as many chances of pleasure as those who are blessed (?) with the more expensive instruments.

It is important that we should understand what we seek before attempting street photography, whether pictorial treatment of locality, or a record of scene or incident which may possess sentiment or merely human interest, according to our mood at the time. The first, of which we have an admirable example in Dovaston's "St. Paul's," is for the few who can take up the work from the higher pictorial standpoint: for those who know the meaning of art as well as of technique. The second is within the reach of all who will make themselves reasonably familiar with the requirements of their subjects. To this class belong some of the best street pictures I have seen, such as Stieglitz's "Wet Day on the Boulevard," Mrs. Ward's "Leather Lane, London," Beeby's "Wet, Foggy Day in New York," and Sutcliffe's "Street Music." Note that these have little, if anything, in them to indicate whether they are bits of Moscow, San Francisco, London, Paris or New York. But it is evident in all that their makers were thoroughly familiar with the localities in which they worked, and gave no little thought to composition, atmospheric conditions, light, weather, etc.

Here we get two profitable hints which may serve as an introduction to all street photography: first, that in the pictorial treatment of typical features of town life an intimate acquaintance with the locality is essential to success; and, second, that for street pictures representing sentiment, incident or character, it is unnecessary to strive to represent locality. In these pages we will look at both classes of work from the practical side, and leave the pictorial worker to evolve from the sure foundation of good technique and sound principles. This is the logical treatment for any branch of photography, for if we have made sure of technical ability, and cultivated our appreciation of what is beautiful or interesting in life, we will surely adopt in our work that particular method of expression best adapted to the subject in hand.

Apparatus.

Let us first take up the choice of apparatus for street photography. There can be no doubt of the superority of the hand-camera over the tripod-camera for this sort of work. For street views at night, of course, a tripod is essential, but for ordinary work in the streets the advantages of the hand-camera are obvious. In the first place the photographer must work as unobtrusively as is possible. With a stand-camera this is out of the question. The man with the little box-camera can stand at a street corner, and snap away to his heart's content with scarcely more than a passing glance from passers-by. The world has grown accustomed to the hand-camera, and this fact must be utilized to its fullest advantage. More than this, if we are to secure records of life and incident free from that consciousness which betrays the fact that the actors in the scene were aware of the camera, we must work quickly, and this is a detail in which the hand-camera is altogether superior to the clumsy camera on a tripod. By practicing the various movements essential to the "finding" of the scene upon the plate, focusing and exposure, we can quickly reach the proficiency and speed of movement required to secure a record which gives us the complete illusion of life. The choice and use of hand-cameras being fully dealt with in THE PHOTO-MINIATURE

No. 3: *Hand-Camera Work*, this branch of our subject will be referred to here only in a general way.

The Camera. In choosing a camera for street work, the reader will, of course, be guided by his individual inclination, or the purpose he has in view. First, in point of convenience, but generally lacking in speed of lens and shutter, comes the simple box or "fixed focus" camera. Here the lens is permanently fixed at such a distance from the plate or film that all objects beyond a certain number of feet away are in focus. A slightly higher grade camera of the same general type has an adjustable focus, which is often a convenience when moving objects are in question. The magazine feature or roller film attachment offers obvious advantages, or a good plate-changing attachment is almost equally useful. Folding cameras are not as convenient in manipulation as the simpler "fixed focus" variety, but they may be used with success by those who have learnt to handle them skilfully, and are usually fitted with a better (more efficient) lens and shutter than the box-camera. The twin-lens or reflex camera is, as a matter of course, the most desirable form of all, although necessarily expensive as far as first cost is concerned.

In the endeavor to produce a camera for general work, which will do many things at a minimum of cost, it happens that our manufacturers have so far failed to give us a hand-camera specially designed for street photography. The requirements of such a camera would be exceedingly simple. It could consist of nothing more than the usual square box with a rapid lens and rising front, together with a fair choice of shutter-speeds. The "fixed" focus lens would be a positive advantage to most users of this class of instrument; and one with a working aperture of *f*/8 would be fast enough for most work, especially if it could be used with a shutter-speed of $\frac{1}{10}$ of a second or over. Fortunately we have one cheap camera on the market, the *Bull's Eye Special, No. 2*, with such a lens, and that its more general use would be entirely practicable is attested by the fact that in its present form it sells at a low price, while others with a single lens working at *f*/16 or smaller may be had at a still lower cost, such as the *No. 2, Bull's Eye*. The writer has used a camera of the class referred to for street work, and has found that it fulfils all ordinary requirements as to sufficiency of exposure. A rising front, with adjustable finder, is all that it needs to make it a thoroughly practical instrument, and such additions could no doubt be made at comparatively small additional expense. For my own part, I prefer the simple box form of camera to the falling-front hand-camera now in general use, inasmuch as it is always ready for use and is so much less obtrusive.

The Lens. I have just referred to the necessity for a lens with a working aperature of *f*/8, usually marked in American-made cameras, No. 4. A very little consideration of the question of exposure will show the necessity for a lens of at least this rapidity. In the case of the box-camera with fixed focus lens, with which most attempts at street photography are made, and to which in this and other fields is traceable most of the ill repute of photography, the largest lens stop or diaphragm is *f*/16, and the only shutter-speed about 1/25 of a second. Now let us see where this leads us. An average landscape in summer, where there are no buildings to obstruct the light, and with no deep shadows in the foreground, will require at least 1/25 of a second for a proper exposure with a rapid plate and *f*/16 stop. With deep shadows or dark objects in the foreground, it will require from 1/15 to 1/8 of a second. The shadow side of a city street with sun shining brightly and persons in the foreground will require at least 1/8 of a second with the *f*/16 stop. On cloudy or rainy days the exposure will run up to 1/2 or even 1 second with that stop. Now the consequence of all this is that the man with his 1/25 of a second shutter-speed and *f*/16 lens is going to give from one-half to one twenty-fifth of the correct exposure for nearly everything that he undertakes, at least in street scenes. The wonder is that he ever gets anything at all worth showing with such inadequate equipment!

If we are to make exposures in 1/25 of a second, we must have a lens which will enable sufficient light to pass to the plate in that length of time to properly expose the plate. As a lens working with the *f*/8 (or No. 4) stop allows just four times as much light to pass through it in a given time as one working at *f*/16, it follows that our exposure of 1/25 of a second with the latter is equivalent to about 1/8 of a second with the former, while a picture which could before have been taken with 1/25 of a second exposure can now be taken with 1/100 of a second exposure, if our shutter provides for it. On the next higher grade of cameras there are frequently three shutter-speeds, "fast," "medium" and "slow." These are rated by the manufacturers as 1/100, 1/50 and 1/15 or 1/20 of a second, respectively. Then there are usually three diaphragms in such cameras, having apertures approximately *f*/16, *f*/22, and *f*/32, or No. 16, No. 32 and

No. 64, respectively. But while the choice of the three shutter-speeds is of considerable value, in many instances the fact that the largest stop requires four times the exposure of the *f*/8 stop above referred to is a serious drawback.

Exposure Shutters.

In the preceding paragraph I referred to cameras having a shutter-speed of $\frac{1}{25}$ of a second. Many photographers seem to have the idea that any shutter-speed higher than this would be out of the question in photographing moving objects. Much, of course, will depend largely upon how fast the objects are moving; but there are very few street scenes worth the taking which cannot be taken with a shutter-speed as slow as $\frac{1}{10}$ of a second. I have found this speed altogether practicable both in regard to the motion of objects in front of the camera, and to motion on the part of the operator as well. By a little practice in holding the camera and making the exposure, it will be found that an exposure of $\frac{1}{5}$ of a second can be made in the hand without the camera moving in the slightest degree, and where a lamp-post, wall, or other support is available against which to steady the box a time exposure of one second can be safely made.

But taking a shutter-speed of $\frac{1}{10}$ of a second as a safe basis, and assuming the use of a lens working at *f*/8, or No. 4, let us see what effect this will have on our exposures as compared with those given before. An open landscape requiring $\frac{1}{25}$ of a second with *f*/16 stop can now be taken with the *f*/8 stop in one-quarter the time, or $\frac{1}{100}$ of a second, thus enabling us to make a very rapid exposure where required. An object in shadow requiring $\frac{1}{5}$ of a second with the *f*/16 stop can now be taken, and an equivalent exposure given, in $\frac{1}{25}$ of a second; and by using a shutter-speed of $\frac{1}{5}$ of a second, and the *f*/8 stop, it will be seen that we get the same exposure as we would have gotten in four-fifths of a second with the *f*/16 stop. In other words, the lens alone enables us to give just four times the exposure that we could give before with the same shutter-speed, and the choice of shutter-speeds ranging from $\frac{1}{100}$ to $\frac{1}{5}$ of a second, places in our hands the possibility of doing any class of work which we will ordinarily care to attempt, not only in summer but at all seasons of the year.

I have gone into this question of the lens and shutter at length, because few amateurs who buy a camera seem to know what they are going to require of it after they get it. To such I can safely say that their money is more than thrown away when they buy a camera which is incapable of meeting the ordinary requirements here referred to.

Adapting a Good Lens. Aside from the single achromatic lens which I have referred to as being attached to the cheaper form of "fixed focus" cameras, the cost of a rectilinear lens working at *f*/8, or larger, is a very considerable item. To any who feel that the purchase of such a lens would not be justified by the amount of work they would do with it, I would suggest the plan of adapting a high-class (rectilinear) lens from a camera in use for other purposes, to the box form of camera. This can be done quite easily whenever the focal length of the rectilinear lens is the same of that of the single achromatic lens supplied with the box; and even where there is a slight difference in focal length, by a simple change in the focusing scale, and blocking out of a portion of the view-glass on the finder. A first-class instrument for street work may thus be secured with very slight additional cost.

Focal Length of Lens. The focal length of the lens employed in the photography of street scenes is a point about which there is much difference of opinion, some advocating the use of a long-focus lens and others one of medium angle. In the great majority of hand-cameras the focal length of the lens is about equal to the base line of the plate. This, when the entire plate is used, results in too violent perspective for ordinary street scenes. The only remedy, and that generally adopted by many advanced amateurs, is to take the picture in the center of the plate, and afterwards ruthlessly trim it down to the dimensions first had in mind. This method has always seemed to the writer better than that of using a lens of very long focus, as it enables one to get many pictures not obtainable with a narrow-angle or long-focus lens. But for the most pleasing results the worker must always bear in mind that many of his prints must be trimmed down to comparatively small size. By subsequently enlarging such portions of a negative as may be required, we get, in an effective way, the scene or incident properly forming the picture. Many of the best pictures we see at the exhibitions are the outcome of this method. The use of a wide-angle lens should, of course, be confined to cases of absolute necessity.

The View-Finder. A view-finder in street work is absolutely essential, whether a hand- or stand-camera be used, as the secret of success is in getting the picture at just the right moment. Without a finder to show exactly the relative positions of objects in the field of view, serious mistakes and disappointments are apt to result. The reliability of the view-finder should be carefully tested before we put our faith in it, as they are seldom placed on cameras with much reference to the lens with which they are to be used. If the finder shows more of the field than is covered by the lens on the plate in use, little strips of black paper (or court-plaster) can be stuck on it until the size of the view is properly reduced. If, on the other hand, the finder shows too little of the view, it should be changed or laid aside, or in the case of a box-camera, a careful mental note made of exactly how far it falls short. If the camera has a rising front, a line should be scratched on the view glass of the finder, corresponding to the bottom of the view on the plate when the front is at its highest point. The proper allowance can then be made when exposures are made with the front raised. The more brilliant the view-finder, the more satisfactory it will be found to be, and if the one on the camera is not satisfactory, the small sum required to purchase one of higher grade will be found to have been well expended.

Level and Focusing Scale.

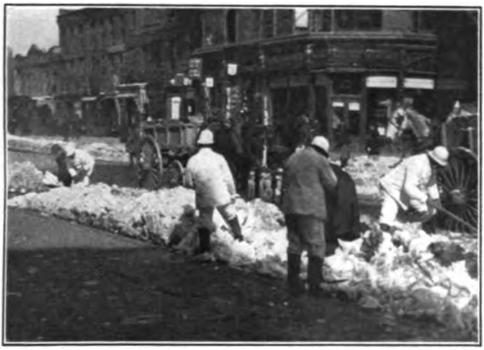
A good circular spirit-level for cameras can be purchased for from fifty cents up, and will be found almost a necessity, as in taking street scenes containing prominent vertical lines it is essential that the camera be held perfectly level at the moment of exposure.

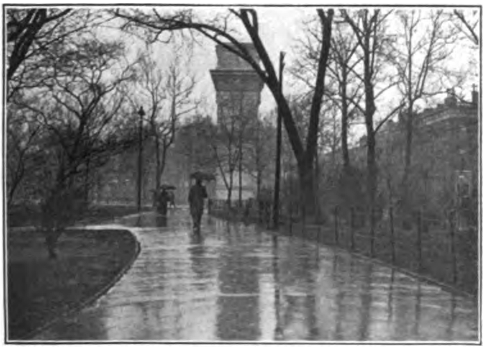
Focusing.

The focusing scale must be carefully tested, as it is of prime importance that the worker be able to focus quickly and accurately. Even where a stand-camera is used it is well to attach a focusing scale, as it will sometimes happen that one wishes to focus anew after the slide of the plate-holder is withdrawn and all is ready for the exposure.

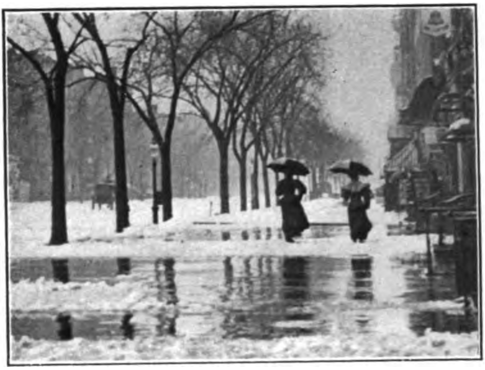
Plates.

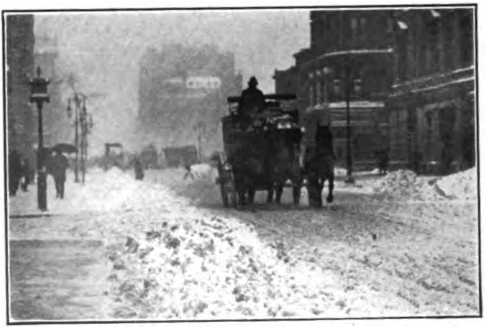
For general street work the fastest plates must be used in order to enable the worker to use his most rapid shutter-speeds where necessary without under-exposure. Fortunately the kodak films in general use with the box form of camera are as rapid as our fastest plates. On another page is given a table showing the relative speed of various brands of plates. Of course, if the worker confines himself to any single class of work not requiring very rapid exposures, he can use whatever plate he is accustomed to use, even though it be a moderately slow one. Non-halation plates of some kind are to be preferred ; it is unfortunate that the commercial brands are somewhat slower than the most rapid ordinary plates.





Street Cleaners: New York
Washington Park: New York
John Beeby





Seventh Avenue: New York
Fifth Avenue: New York
John Beeby

To get the advantages belonging to non-halation plates, and at the same time the advantage of the greater rapidity of the ordinary plate, backing may be resorted to. Prepared backing for the purpose can be obtained on the market, and in nearly all cases is easily applied and quickly removed. A good formula for backing was given at page 27 of the last number of THE PHOTO-MINIATURE. To those who object to backing on account of the time it takes in drying, I would suggest that sheets of black paper cut to the exact size of the plate can be used to prevent the moist backing from coming in contact with the inside of the plate-holder. With films no backing is necessary, there being no reflecting surface as in the case of glass plates. The necessity for backing will be the better understood when I say that it has been fully demonstrated that a portion of all the light falling on the sensitive surface of an unbacked plate is reflected back to the under side of the sensitive film, thus giving a double exposure throughout. Where the light is weak, as that reflected from the shadow portions of the view, this reflected light has no material effect, but where it is stronger, as that reflected from the high lights, it is considerable, thus increasing the exposure in the higher lights in a marked degree. In other words, the reflected light results in a double exposure in just those portions of the plate in which we do not want it. There are other causes of halation which the backing does not remove, but the reflected light referred to is the chief difficulty, and is usually overcome by backing. Now the backing, when properly prepared, absorbs a great part of this light coming through the plate, thus allowing practically none of it to be reflected back into the film from the glass surface of the plate. From the uneven nature of the lighting of street scenes, half in sunlight and half in shadow, it follows that some such precaution is particularly necessary in this class of work.

With this preliminary knowledge of the field of work and the necessary tools, we can now address ourselves to the difficulties attending practical work in the streets. These difficulties are of two separate and distinct classes. There is, first of all, the difficulty of giving pictorial value to our work; and then we have to face the very practical difficulties of technique. Let us take them up in the order here given. I do not apprehend that many of my readers will care to take up street-photography purely from the pictorial point of view, but a knowledge of picture-making will always add a desirable quality even to the simple record of fact.

The Study of Good Pictures. The ordinary city street is not a thing of beauty, as we generally see it, although changing seasons or atmospheric conditions will often give it a more desirable aspect or a touch of mystery. The appreciation of these changes and their pictorial effects will enable us to make pleasing pictures even from the commonplace row of houses, with uncompromisingly monotonous fronts, hemmed in by trees, telegraph poles, lamp-posts and the like, which usually make up the average city street here and abroad. To get this faculty of appreciation, nothing is more useful than the study of what others have done in picture-making with the same material. Especially by the study of the lines in the best examples of this class of work may we learn something of their make-up, and the reason of their success. Let us take a few modern street pictures and look at them in this way, observing particularly the choice of point of view, the disposition of lines, and the location of the point of chief interest.

The picture entitled "Rain," by H. C. Leat, in *Photograms*, 1899, may well be chosen as our first example. A very rough line sketch of it, such as we have in Fig. 1, will serve our purpose, though I would like the reader to see the engraved reproduction and admire it for those beauties of technique which it possesses so abundantly, and which are wholly lost in this method of reproduction. Note first the direction of the principal lines and the placing of the figures. It will be noticed that all the principal lines, except those of the tree on the left, converge toward the figures with the umbrellas. This does not seem a premeditated arrangement altogether, since it appears to be wholly natural, yet it is remarkably effective in drawing our attention to the figures *and allowing it to rest there*. Study the composition of this picture carefully, noting the effect of the foreground, which is not a complete study in itself, but likewise serves to draw the eye to the figures. *Now* glance at Fig. 2. Here I have attempted to depict the scene as it would have appeared taken from a point three feet from the picket fence instead of twenty. Note how the eye is led on past the figures, and out beyond the distant buildings. The loss of pictorial value, so distinctive of the first, even as a line drawing, but so utterly lacking in the second. is unquestionably due to the second method of handling the principal lines. Now were we to take this picture (Fig. 1), and deduce from it a general rule that we should always run our principal lines toward the object of main interest, we should be called by the artists arbitrary or dogmatic,

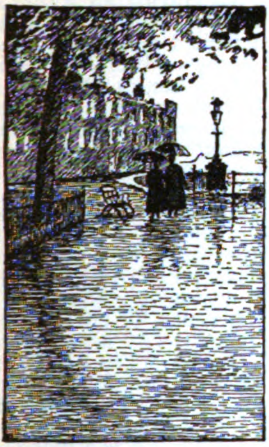


Fig. 1.

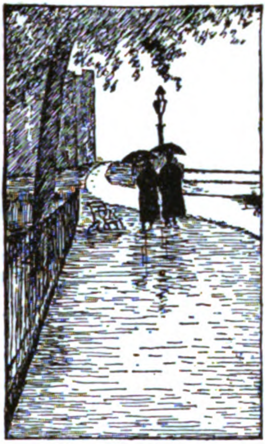


Fig. 2.

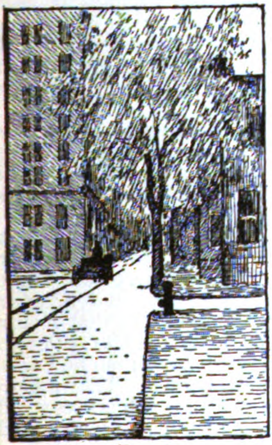


Fig. 3.

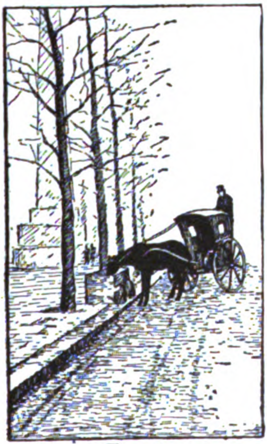


Fig. 4.

and therefore we must satisfy our craving for a rule in the premises by looking at other pictures of the same class, and see how others have treated these same lines. Let us glance at Fig. 3, John Beeby's "Wet Weather in New York," and Fig. 4, Harold W. Lane's "November Morning, the Embankment," both shorn of their beauties of technique and reduced to simple line. It will be seen that the same method of handling the principal lines, curbstones, etc., which we thought must be so difficult to handle effectively, is common to all three of the pictures. A careful study of other good street pictures, which can be found from time to time in the annuals and other periodicals, will show the same treatment, and, therefore, in making street pictures, we may feel perfectly safe in following these general lines.

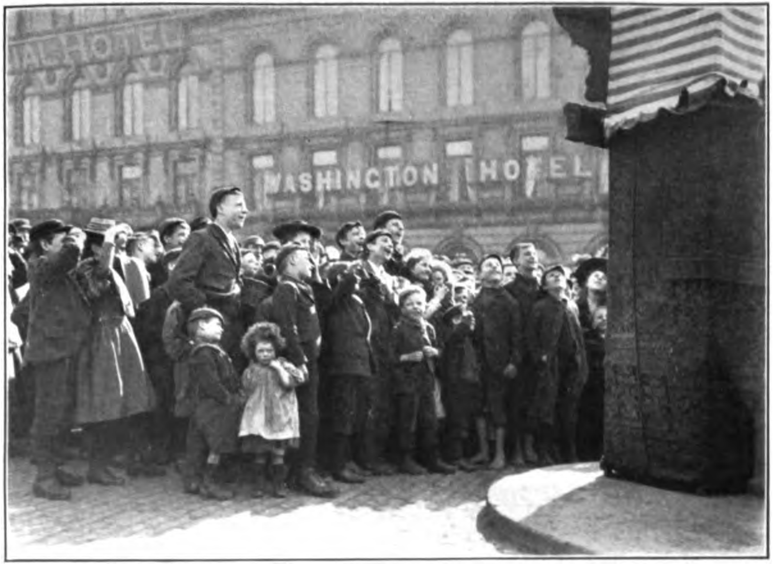
I have said, in speaking of Fig. 1, that the effect of the use there made of the converging straight lines was to allow the eye to rest upon the figures. The danger in carrying a principal line in any other direction than toward the point of interest is that it unconsciously leads our eye away from the point, and this is invariably to be avoided. Therefore, if we cannot make a line help our picture we must at least see that it does not mar it.

This practice of reducing pictures to lines is commended to the beginner in pictorial work as offering an easy and effectual mode of studying composition. By applying it to our own pictures we often see their defects for the first time, and wherein others have succeeded where we have failed.

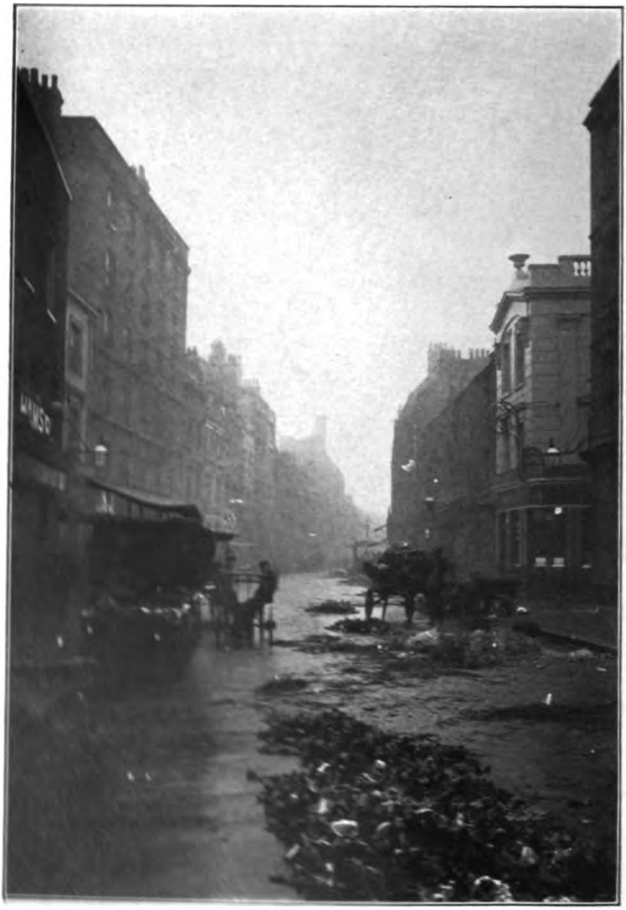
Simplicity.

But there is another lesson to be learned from the study of these rough sketches, and that is the value of simplicity. This is the keynote of success in street photography. Too often we see the amateur trying to take everything on a street in the effort to get a good street photograph. Mr. Stieglitz, whose hand-camera pictures are well known, has accomplished this well in his "Wet Day on the Boulevard," which can be seen in *Sunlight and Shadow*, and possibly elsewhere. But a reference to that picture will show the beginner conclusively that he had better not attempt the feat until he learns vastly more than he knows now of both composition and technique. That picture possesses in a high degree the quality which artists speak of as unity, without a full understanding of which such pictures had better never be attempted.

But reverting to the line drawings, Figs. 1 to 4, note how thoroughly simple in composition they all are. In Fig. 1, we have the two figures with umbrellas as the sole ob-



HAPPY MOMENTS
Chas. F. Inston



LEATHER LANE, LONDON

[illegible] Ward

jects of interest, and they form practically one object, a group. In Fig. 3, we have the driver and cart; aside from that nothing but straight lines. In Fig. 4, we have nothing but the horse and vehicle and straight lines again. Without the figures the pictures would have been of little value. With a conglomeration of figures and objects of interest entirely separate and distinct from each other, with no connecting and common sentiment between them, we should have simply distraction, which is fatal to pleasure either in making or looking at pictures. Simplicity and concentration are two rules of great importance in street photography. Now let us glance at the meaning of composition and its application in making street pictures:

Composition. Composition in its art sense really means nothing more nor less than that which is composed, and, in photography, practically covers selection and arrangement. But as we cannot change the lines or grades of streets, the location of buildings, or the position of passing people, by composition of line we photographers mean entirely the choice of a point of view. We must choose our point of view so that the lines of the streets will run in the most pleasing manner. And so with the buildings; as we cannot change their location we must ourselves move about until we find the point from which they will look best in relation to or compose with the other elements of the picture; and again, with passing people and vehicles, we must wait until they are so disposed as to bear the most pleasing relations to other objects of the view.

Now, an artist in painting a picture has before him at the start but the bare canvas, and on it he places the various objects and lines which go to make up his picture. If he wants a figure in a particular place he puts it there, and so he goes on with every other feature of the picture, carefully studying each little point and each little relation of line, light, shade, etc. But we photographers do not work in that way. The picture is before us. It is for us to take it or not to take it. We have not had the advantages of training in art schools, or a life-long association with art to help us in choosing the most pleasing aspect or point of view, and many of us have given but little, if any, thought to the study of works of art or the principles underlying them. For these last we must look to the work of those who have studied them, and seeing the principles or rules they have apparently followed, try to follow them ourselves. An artist will tell you that there are no rules of art, in the ordinary sense; but if you ask him to criticize one of your pictures for you he will point out at least half a dozen rules which you have broken. Under these circumstances it may be profitable to formulate or suggest a few general principles which should govern us in the selection of the point of view in taking street pictures with life or without.

Point of View. In the first place, we should never take a picture right up the middle of the street. The reason for this rule is that the various straight lines of the view cut the picture space into triangles of regular proportions. The eye loves variety, and if we are to have triangles in our picture, we must try to make them of unequal shapes and dimensions.

Point of Interest. Again, we must have some one main object of interest in our picture,—something at which a person viewing our picture can look, and feel that we were looking at it when we took it. This does not mean that we should have only one object, but that all the other objects in the view should be subordinate to the main point of interest. In other words, there must be a resting place for the eye. The painter or etcher does this in many ways: by line, by light and by color; but we are usually, in street work at least, confined to the first method. The method of concentrating interest in one object by line merely was shown in Fig. 1, and we would do well to follow that method wherever possible. But where it is not possible or desirable to have strong lines run to the point of interest, we must trust to the character of the object to arrest attention to the exclusion of others, and see that there are no strong lines leading the eye away from it. Thus in Fig. 2 we saw that the lines of the avenue behind the figures led the eye on past the building in the distance. More frequently it will happen that these distracting lines will come in the foreground of our picture. In such a case we must simply change our point of view or go without the picture. It is better to have no picture than a bad one.

Vertical Lines. It frequently happens that there is a tree, telegraph post, or other strong vertical line right within the field of view as we would wish to have it. The rule in regard to lines of this character is that they should never be allowed to bisect the picture, that is, by running from top to bottom. Nor should they be so close to the side of the picture as to draw undue attention to the margin. They should be taken from a distance wherever they cannot be avoided, and if very prominent they must be made to run somewhere near the main object of interest, as in the case of the lamp-post in Fig. 1. There is nothing that looks worse in a street picture than a large section of a tree-trunk or telegraph post prominently in the foreground, or at one side of the picture—always excepting Calland's clever picture of "The Mall." Strong vertical lines are dangerous, however we take them, and should not be included in the view unless they serve a good purpose. Aside from this, their treatment is largely a matter of individual taste, and no one rule can be made to apply to all cases. A thoroughly delightful treatment of vertical lines is found in Fig. 5, a line sketch of F. C. Lambert's "Speed the Parting Guest."

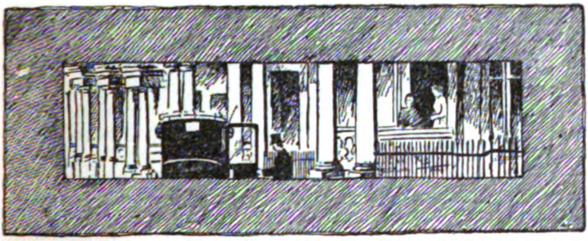


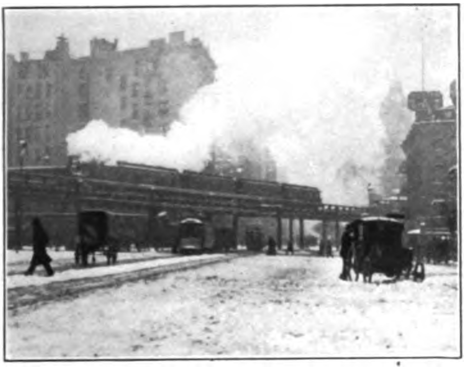
Fig. 5.

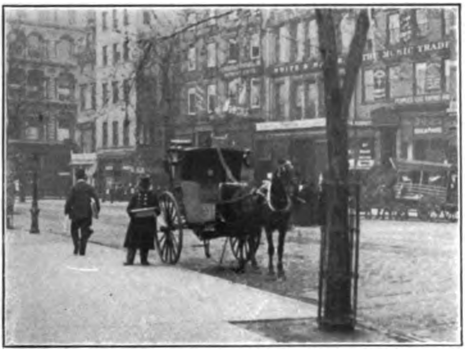
Angularity. In dealing with any view containing a large number of straight lines, or even a few prominent ones, we will necessarily find a large number of angles. Now when we enclose these lines within four other straight lines (the bounding lines of the print) the result will be a vastly increased number of angles and triangular spaces. This cannot be wholly avoided, but we should see to it that there is variety in the angles, and that, as far as possible, the angles themselves are pleasing. Thus an angle of 45 degrees is much more pleasing than one of 90 degrees, and one of 25 degrees more pleasing than one of 45 degrees. This does not mean that we should measure all the angles in the view, but rather that we should give them due consideration in choosing the point of view. This we can only do by studying the view as we find it on the ground-glass or view-finder. The angles there are just as they will be in the print, and they afford just one more point for the artist's consideration in what has by now, I fear, grown to be rather a complicated study. However, all this is merely a preliminary course of training. After awhile one learns instinctively to choose the proper point of view without realizing why he does so.

Foreground. The proportion of foreground to the rest of the picture must depend upon what is being taken. If it is a view of the buildings on either side of the street, or an object of interest some distance up the street, the foreground should not occupy over one-third the picture space, and this is done, not by tilting the camera, but by holding it as high off the ground as is necessary to give the desired view. If, however, we are taking a picture of some little incident of street life, where the object of interest is near the camera, the foreground may properly occupy two-thirds of the picture space, and this, again, is accomplished by holding the camera perfectly level, but nearer the ground. The solution of the problem lies in what I have said on the subject of concentration,—if we wish to attract attention to something in the foreground then we should not put in the picture a vast space of that which is beyond the foreground and which will necessarily distract attention from the main object of interest. If, however, we wish to attract attention to that which is at a distance, then we should not detract from that by the addition of a mass of foreground detail. We should never try to get too much in our pictures. If there are elements of interest in the foreground, middle distance and distance, each of which is in itself sufficient to attract the attention of the observer, we must sacrifice one or the other. I can recall a world-famous snow scene of a New York avenue where this anxiety to get in the picture everything in sight so confuses one that it is impossible to tell what the photographer himself considered the main point of interest. This may make good photography, but it is poor art, inasmuch as it violates the fundamental principle of unity, which is the beginning and the end of art.

In the foregoing we have only touched upon the subject of composition, but enough has been said to show the reader that successful street photography is not merely a matter of walking out into the street and snapping at the first interesting object in sight. Let us now look at the technical side.

Exposure. Nearly all of the technical difficulties of street photography are embraced in the single subject of exposure, and as greater difficulties in the matter of exposure are encountered in street work than in any other single branch of photography, and that, too, at times when the worker has no





Sixth Avenue, Herald Square: New York
Union Square: New York
John Beeby

STREET MUSIC
Frank M. Sutcliffe

time most frequently to consult exposure meters, tables or the like, I am going to take this opportunity of going into the subject thoroughly. In other words, I am going to start where the practical side of it begins, and carry it through until the reader can feel that he is henceforth his own exposure meter. Exposure has always been treated by writers as a matter of the greatest difficulty, and the beginner is told that he can only learn its intricacies by dearly bought experience. While this is true to a certain extent, his experience can be made of much shorter duration if he is made to understand in the beginning a few of the principles which govern the subject.

Stops. First, as to stops or diaphragms: It not infrequently happens that writers in magazines refer to certain stops in a manner which shows either that they are very careless or do not know what they are writing about. This whole subject was taken up exhaustively in the first number of THE PHOTO-MINIATURE: *Modern Lenses*, to which the reader is referred as the easiest way of avoiding repetition here, but the point I wish to make is that with all lenses the stops or diaphragms bear certain relations to each other which, when once found, govern the relative exposures with the various stops of the same system. The simplest of all systems of diaphragm numbering is that known as the Uniform System, in which the No. 4 stop, for instance, allows twice as much light to pass through it in a given time as the No. 8 stop, and sixteen times as much as the No. 64, and hence requires one-half or one-sixteenth the exposure of those stops respectively. Hence, if we know the correct exposure to use with the No. 8 stop, it is a simple matter to say what it will be with the stops Nos. 4, 16, 32, 64 or 128. By referring to the tables given in *Modern Lenses*, the reader will be able to find just what the relations are between the stops with his lenses. I go into the matter at length because I have, on occasion, met experienced photographers who have had to learn by experience the relations between the various stops of their different lenses, and never seemed to imagine that there was a mathematical relation between them all.

In almost all the cameras on the American market the stops are numbered according to the Uniform System, but no matter what the system, the worker must familiarize himself with it thoroughly, so that he can tell without a moment's thought what he must multiply or divide by if he knows the exposure for one stop and wishes to use some other.

A photographer should select the stop which he uses most and then think of all subsequent exposures in that stop. Thus, suppose he has selected the No. 8 stop as his basis for learning exposure. And let us suppose that he has at some time in the past given an exposure of $\frac{1}{5}$ of a second with the No. 64 stop, with a given light; and at another time he has given $\frac{1}{20}$ of a second with the No. 16 stop in about the same light. Now he wishes to make an exposure in the same light with the No. 32 stop. He will first try to remember what he gave with the No. 64 stop, and then what he gave with the No. 16 stop, and possibly what he gave with various other stops. How much simpler it would be if all along he had said to himself, "This is a $\frac{1}{40}$ of a second light," and meant by that that it was such with the No. 8 stop. Every exposure with a given light then helps to fix in his mind the value of that light, and, instead of trying to remember a dozen different exposures as a guide for the next, he is each time fixing the one main point more and more firmly in his mind. After calculating the light as if with the No. 8 stop, it is merely mechanical to use some other stop and calculate for the difference.

Nature of Subject.

The next step in arriving at exposures is a little more than a matter of memory, as reason and judgment both enter into it. I refer to the effect of the nature of the subject on the length of exposure.

This difficulty is greatly simplified if we remember the old maxim, "Expose for the shadows and let the high lights take care of themselves." By shadows, however, we do not mean merely sun-shadows, but we mean those darker portions of the view which would be most likely to be under-exposed if we expose for the high lights. Thus, a whitewashed fence in sunlight can be taken with a remarkably short exposure and full detail preserved; but if there is a young lady leaning against the fence, and holding a parasol to shield her head from the sun, the fact that the fence was white should not influence us to the extent of giving the combination the same exposure as was given to the fence alone. If we do, we shall have simply a black lady against a white fence. Again, with a landscape: If we are standing on the top of a hill, and the view rolls away for mile upon mile in the distance, we can properly expose for it; but if we are standing on a level with the same view in the distance, and have a group of dark cattle or other objects in the foreground, we must expose not for the distant landscape, but for the cattle. Again, and here is where judgment must come in: if the point of interest in a landscape is the middle distance, but there are some small, loose stones in the foreground casting shadows, we should not expose for those stones or their shadows, but should expose for the middle distance. This makes what we can properly call a strong foreground, and the tendency of the minute, under-exposed patches is to add a pleasing sense of distance to the landscape proper. To expose for the shadows in the foreground in this case would be to over-expose our plate as a whole, and we should have a flat picture. But if our main point of interest is the middle distance, and there are large rocks or heavy shadows in our foreground which would be mere black patches if under-exposed, then we must expose for the rocks. Now let us take another instance. We wish to picture a street or landscape where the shadows form the most artistic and attractive feature. We naturally desire to preserve those shadows to the fullest extent, but we also wish to have detail in them, in other words, transparent shadows. Knowing the proper exposure for the shadows, we should in such a case give an exposure slightly shorter than the proper one, thus giving greater depth to our shadows, and making them more prominent than they would be with a very full exposure. But if we wish to expose on an autumn landscape, and preserve the crispness characteristic of such scenes, we do not want any heavy, warm shadows, but can best approximate the actual conditions by giving a full exposure and strong development. Thus it will be seen that judgment must form a large part of the photographer's equipment if he would produce the results at which he aims, and the advantage of using judgment in making the exposure is that it saves all future manipulations when it comes to making the print. But, as will be seen, one cannot under-expose a trifle or over-expose just a little at will, unless he knows in advance just what the proper exposure is.

Now, as we had a unit for a starting point in the matter of stops, so we must have a unit in the matter of subjects. In this instance we take as a unit what is called an "average landscape," by which we mean a landscape with a light foreground, but having some slight shadows or small dark objects in the foreground, as distinguished from a foreground having dark, heavy foliage and deep shadows near the camera. In the term "average landscape" is included buildings not less than thirty or forty feet from the camera, or persons or animals at that distance. Thus a city street might be an "average landscape" if we were taking a section of it thirty or forty feet from the camera, but not if we were taking a section of it in shadow nearer.

An "open landscape," by which we mean one with no dark objects in the foreground, but with the objects of chief interest in the middle distance, can be taken and fully exposed in one-half the time necessary for the "average landscape." The same rule holds for light objects at some distance from the camera, such as white buildings, monuments, etc., with dark objects or other buildings near them, but at some distance from the camera.

For portraits out of doors, taken at a distance of from four to twenty feet, dark, heavy foliage, red brick buildings and the like, we should give double the exposure required for average landscape.

For snow scenes, where we wish full detail in the snow, and where there are no dark objects near the camera, or for extremely distant landscape, we divide the normal exposure for the average landscape by 4. For views at the seashore, with ships or light foreground, we again divide by 4, thus allowing for the increased actinic value of the light, but for shipping generally, as seen at the docks, it is better to expose as for dark objects; viz.: multiply the normal exposure by 2.

For distant sea views or ordinary clouds we divide the normal exposure by 8, but for heavy clouds by 4, and light fleecy clouds or late evening rays by 12 or 15.

Now all this may seem at first sight a great deal to remember, but by dividing it into classes and using our reason in placing the various subjects in the different classes it is very easy to do. Thus:

Average landscape	1
Open landscape	½
Portraits and dark objects	2
Snow scenes, etc.	¼
Clouds, distant sea views	⅛

Surely this is not a difficult combination to remember: ⅛, ¼, ½, 1 and 2. By a very little effort the worker will be able to place a subject in its proper class without a moment's thought when in the field. But as with the stops, we must always relate back to our unit, and when we face a subject in a given light, we must first think what exposure would be required if it were an "average landscape." As will be seen later, a single exposure will suffice for "average landscape" in sunlight, with a given stop, for quite a number of the summer months, and variations from that for different causes are as simple as those which have gone before.

Intensity of Light.

Having learned fully the effect on the exposure of the size of stop and nature of the subject, we are prepared to pass on to another set of relations just a little easier to learn than the last. They are best expressed by a table to begin with.

Intense sunlight	**1**
Sun obscured, but bright	**2**
Sun obscured, dull	**3**
Dark, heavy clouds, very dull	**4**

Thus we have intense sunlight as the unit, and multiply the proper exposure for that by 2, 3 or 4, as the conditions may require. But here, again, the photographer must use his judgment, as there are different degrees of brightness as there are of dullness.

Now let us put what we have learned into actual practice. It has been found by many that the proper exposure for an average landscape in sunlight at midday during the summer months, with the No. 8 stop and a rapid plate, is approximately 1/60 of a second. This is the basis of the best exposure tables, is shown by exposure meters to be correct, and has stood the test of actual experience. Therefore we can safely take it as our unit. This unit holds approximately for all the summer months from April to August, and during those months from 9 a. m. to 3 p. m. But we should bear in mind that while it may be a full exposure for such conditions in June, it will be a scant exposure for April and August, when the light is weaker. And again, while it may be ample for 3 o'clock in June it will be quite scant for 3 o'clock in August.

But taking that as our unit, let us suppose that we are out with our camera, and wish to take a picture of a group on the lawn on a dull day in the middle of August, with No. 64 stop and a rapid plate. Our method of arriving at the exposure required would be as follows, in the light of what has been said: If this were an average landscape in sunlight it would require 1/48 second with No. 8; as it is a group it will take twice that, or 1/24 of a second; but it is a dull day and not sunlight, so it will take three times that, or 1/8 second, and as we are using the No. 64 stop instead of the No. 8, it will take eight times that, or one second. If you were using the *Photo-Beacon Exposure Tables*, instead of following this method, you would turn to Table I, No. 64 stop, and find for August between 10 a. m. and 2 p. m. the fraction 1/6 second. You would then turn to Table II, and find under "Portraits" and "Dull," the figure 6. You would then turn to another table, and at the intersection of these two figures you would find the letter "e," and by referring to another table you would find "1," which means one second. But, after mastering what I have written, you will know why it is that you allow for all these things, and if it were quite dull, but not "very dull," you would add a little to your exposure and know exactly why you do it. The tables I have referred to are a great help to the beginner, and by all odds the best on the market, but unless the amateur understands the why and wherefore of things connected with exposure, he is apt to be dependent on such tables all his life, when he might just as well be learning as he goes along.

Now, understanding that 1/60 of a second is approximately correct under the conditions named for the summer months, it will be very easy to bear in mind that the exposure increases gradually until midwinter, when it is four times that, or 1/15 of a second; and that even at that the same exposure will hold for but an hour or two before and after noon. In February, March, September and October it will be about half of one or double the other, or 1/30 of a second.

This unit of exposure, however, is not given for blind following at any hour or any season, but is merely the basis from which calculations should be made, and should be used merely as a basis, the photographer calling upon his own common sense and reasoning powers to guide him when a little in doubt. Thus, as I am writing it is the last day of March, but I would neither give 1/60 of a second under the standard conditions named, because it is almost April, nor 1/30 second, because it is still March, but would give about 1/50 of a second, because my reason tells me that such an exposure would be most likely to be correct. It is all very well for the man who makes exposures every day and under all conditions to say that he can judge the strength of the light by looking at the ground-glass, but we who make comparatively few exposures, and those under totally different conditions, will do far better if we start with a unit, and from it work out the correct exposure.

Unfortunately, there is not even an approximate ratio which we can apply to the varying intensity of light at different hours of the day. For instance, the exposure on a certain day in December at 5 o'clock may be one second. At a quarter past 5 on the same day I have given ten minutes to the same view. A week later the view at 5 o'clock would take the ten minutes, and one at a quarter after would require waiting until morning. The best that I can do for my readers in this line is to construct a table of exposures based on the normal exposure of 1/50 of a second for "average landscape" in June in bright sunlight, with No. 8 stop and rapid plate. I have constructed the table from Dr. Scott's *Table of Comparative Exposures*, to be found on page 126 of THE PHOTO-MINIATURE No. 3: *Hand-Camera Work*. The exposures given correspond approximately with my own experience, and fairly well with other accepted tables. By making due allowances for the different stops, atmospheric conditions and subjects, this table will be found a safe guide for practical work. I repeat that it is calculated for the No. 8 stop, "average landscape," bright sunlight, and rapid plate.

TABLE OF EXPOSURES

Hours of Day A. M.	P. M.	June	May July	April Aug.	Mar. Sept.	Feb. Oct.	Jan. Nov.	Dec.
12								
11	1	1/50	1/50	1/40	1/30	1/25	1/15	1/12
10	2	1/50	1/50	1/40	1/30	1/20	1/12	1/10
9	3	1/50	1/40	1/30	1/25	1/12	1/4	1/3
8	4	1/30	1/30	1/25	1/15	1/6		
7	5	1/25	1/20	1/15	1/8			
6	6	1/20	1/15	1/8				
5	7	1/10	1/8					
4	8	1/4						

Except for the early and late hours, the above table embraces practically nothing beyond what I have already said at greater length, and hence it should only be used during such hours. The effort should be to become independent of tables at the earliest possible moment, and when we know that 1/50 of a second is a safe exposure under the conditions named for the summer months, between 9 and 3 o'clock, that it is to be doubled for early spring and late autumn, and quadrupled for winter; and realize when and why it is a full or scant exposure, we know pretty much all the table tells us, and *are* independent of it to a great extent.

Plate Speeds. Now the last allowance, that for differences in the speed of different plates, is simple for the man who uses one plate and one only. All he has to do, if he uses a plate of half the speed of the most rapid, is to double his unit in the first place, and call it $\frac{1}{25}$ instead of $\frac{1}{50}$, as I have done. But if he uses a great variety of plates, or even more than one, he must make the allowance with the others. I divide the American plates, to be found generally in our stock-houses, into four classes, but the ratings are at best only approximate, and if one finds by continued experience that a given plate is more or less rapid than I call it he will have to rate it for himself. I have tested comparatively few of them, with the view to ascertaining particularly their rapidity, but have rated them as I find them generally rated in accessible tables, making only such changes as I am confident, by my own experience and careful tests, are necessary. *Class 1* requires the normal exposure; *Class 1½*, one and a half times; *Class 2*, twice; and *Class 4*, four times the normal exposure.

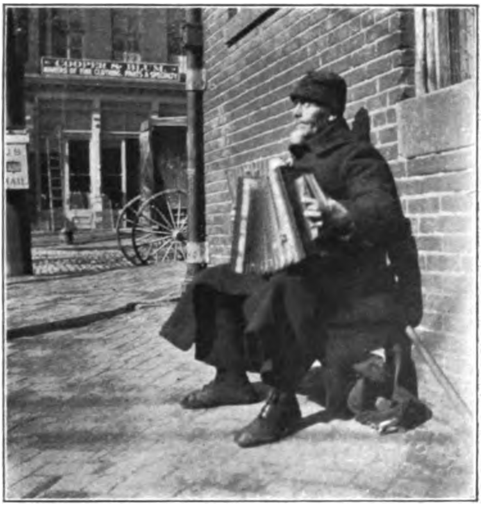
Class 1. Cramer Crown, Cramer Instantaneous Isochromatic, Eastman Red Label, Eastman Kodak Films, Seed Gilt Edge No. 27, Stanley 50, Hammer Extra Fast, Lovell Extra Rapid, Forbes Instantaneous.

Class 1½. American 50, Cramer Banner, Hammer Red Label, New York Record, Seed No. 26.

Class 2. Seed Non-halation, Carbutt's Eclipse, Carbutt Ortho. 27, Cramer Medium Isochromatic, Eastman Yellow Label, Seed 23, Wuestner Non-halation Ortho., Standard 50, Stanley 35, Lovell Rapid.

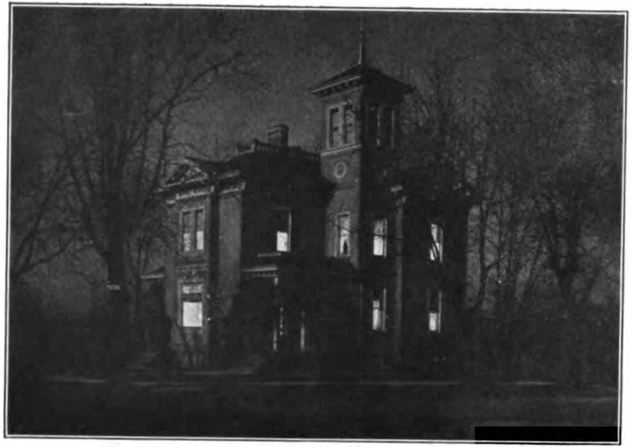
Class 4. Carbutt Ortho. 23, Cramer Isochromatic Slow, Hammer Slowest.

The first fault which the photographer will find with the tables I have given is that, by the time he has finished multiplying and dividing, he will find that he requires an exposure which his shutter doesn't give. The same objection is met in all exposure tables, and can be overcome to some extent in various ways. First, give the nearest shutter-speed, if it is approximately the same; second, if the nearest shutter-speed is much too short, and a diaphragm shutter is used, enlarge the diaphragm a little; where the mechanism of the shutter allows it,



Usborne I. Yellott

Fig. 6



Osborne I. Yellott

Fig. 7

move the disk to a point between two speeds. If none of the above are feasible, see if using another stop will bring it nearer one of the shutter-speeds; but always aim to give a full exposure rather than a short one.

And now, before leaving my tables and the system which I have outlined step by step, let me add a word of caution. Many of my readers will no doubt say that the standard I have taken is wrong; possibly some of them have taken an average landscape in $\frac{1}{100}$ of a second under the conditions named and obtained good results. Well, so have I, but that proves little or nothing. Ninety out of every hundred of the cheaper cameras on the market today have their stops more or less improperly numbered, thus making the first variation. Ninety-nine out of every hundred shutters do not work at exactly the rated speed, thus making another. Different boxes of plates by the same makers often differ in degree of rapidity, thus making another. Developers are sometimes used at different temperatures or different strengths, thus making another. And so I might go on and on, and point out reason after reason why individual experiences may differ. But the best test of a pet idea on exposure is to double and halve. Thus, if $\frac{1}{100}$ of a second is argued the proper standard instead of $\frac{1}{50}$ of a second, try the subject at $\frac{1}{200}$, or with No. 16 stop, and again at $\frac{1}{50}$. If the $\frac{1}{200}$ is a bad under-exposure, it shows that the $\frac{1}{100}$ standard was too near the margin of the plate's latitude. The $\frac{1}{50}$ is taken as the mean between under- and over-exposure, and its use allows great latitude for variation in stops, shutters, subjects, light and plates. It is unfortunate, but true, that we are obliged to allow for variations in all of those particulars. And now, with this clear grasp of the most important of all factors in photography outdoors, let us turn to its application in street photography under varying conditions.

Shadows. I have so far said little or nothing about shadows, and the street photographer will meet them in abundance. Of course an object in heavy shadow, as under a porch, will require a longer exposure than one near the edge of the shadow of a building, where reflected light strikes it in greater abundance. Much will depend, too, upon whether we wish to represent an object as in shadow, or whether we wish to make a good bright picture of it, and so represent it as if in subdued light. If the latter we would give a maximum exposure, but if the former we would give a shorter, thus making the desired contrast between the shadow and the sunlit portions of the view. But generally, an object in deep shadow in summer near the middle of the day will require fully four times the exposure that it would require if in sunlight, more if the shadow is very deep, less if light. Thus a picture of a group on a sidewalk in shadow would require doubling for subject, i. e., $\frac{1}{32}$ of a second, and quadrupling for the shadow, making $\frac{1}{8}$ of a second the proper exposure. But a view up the street, the nearest darks of which were thirty or forty feet from the camera, would require merely the exposure for "average landscape," unless the buildings were red brick, when it would be better to double it. In winter, however, or late in the afternoon, when there is less contrast between the shadows and the high lights, it will be found that the shadows require only double the normal exposure. To go into the reason for this would require me to depart from my original intention and get into the science of exposure, so I will leave the doubtful reader to test it for himself.

The Stop to Use. In undertaking to say which stop one should use in taking pictures of any kind, I do not care to involve myself in the discussion which has shaken the photographic world for so many years, and which will never be settled to the satisfaction of any part of it, since no one of the many sides of the question seems to understand what any other side is talking about.

The rule which I myself have adopted is simple enough and may be good enough for some few of my readers. If the conditions are such that I see things clearly, I focus so as to show them clearly. If they are such that I do not see things clearly, then I focus so as to produce a certain amount of diffusion. But as my eyes, which the oculist tells me are unusually good, do not enable me to see beyond the middle distance with microscopic definition, I try never to focus the middle distance so as to show it with microscopic definition. Thus, if I am taking a street picture on a bright, clear day, I may use the *f*/16 stop and focus sharply on some object short of the middle distance, but if that brings my middle distance out too sharply I use a larger stop until I get what I want. But again, if it be a wet and misty day, when I see objects indistinctly, or rather so that the impression is that I so see them, then I focus them so as to produce that impression on others.

It is frequently desirable to know the exact distance at and beyond which all objects are in focus with a given stop, and lens of given focal length. A table showing this will be found in THE PHOTO-MINIATURE, Vol. I, No. 3: *Hand-Camera Work*, page 112, or on page 14 of *Modern Lenses*, before referred to. I repeat the first of these here to obviate the trouble of reference:

SALOMONS' TABLE OF DISTANCES, AT AND BEYOND WHICH ALL OBJECTS ARE IN FOCUS.

FOCUS OF LENS IN INCHES	RATIOS MARKED ON STOPS													
	f/7	*f*/8	*f*/9	*f*/10	*f*/11	*f*/12	*f*/13	*f*/14	*f*/15	*f*/16	*f*/17	*f*/18	*f*/19	*f*/20
	Number of feet after which all is in focus													
4.....	19	17	15	14	13	12	11	10	9	9	8	8	7	7
4¼...	21	19	17	15	14	12	11	11	10	10	9	9	8	7
4½...	25	22	19	17	16	15	13	13	12	11	10	10	9	9
4¾...	27	23	21	19	18	16	15	14	13	12	12	11	10	10
5.....	30	27	24	21	19	18	17	15	14	14	13	12	11	10
5¼...	33	29	25	23	21	20	18	17	16	15	14	13	13	12
5½...	37	31	29	26	23	22	20	19	17	16	15	15	14	13
5¾...	39	34	31	28	26	24	22	20	18	18	17	16	15	14
6.....	43	38	33	31	28	26	24	22	21	20	18	17	16	15
6¼...	47	41	37	33	30	28	26	24	22	20	20	19	18	17
6½...	50	45	40	36	33	29	28	26	24	23	21	20	19	18
6¾...	55	48	43	39	36	32	30	28	25	24	22	22	21	20
7.....	58	52	45	42	38	35	31	30	28	26	25	23	22	21

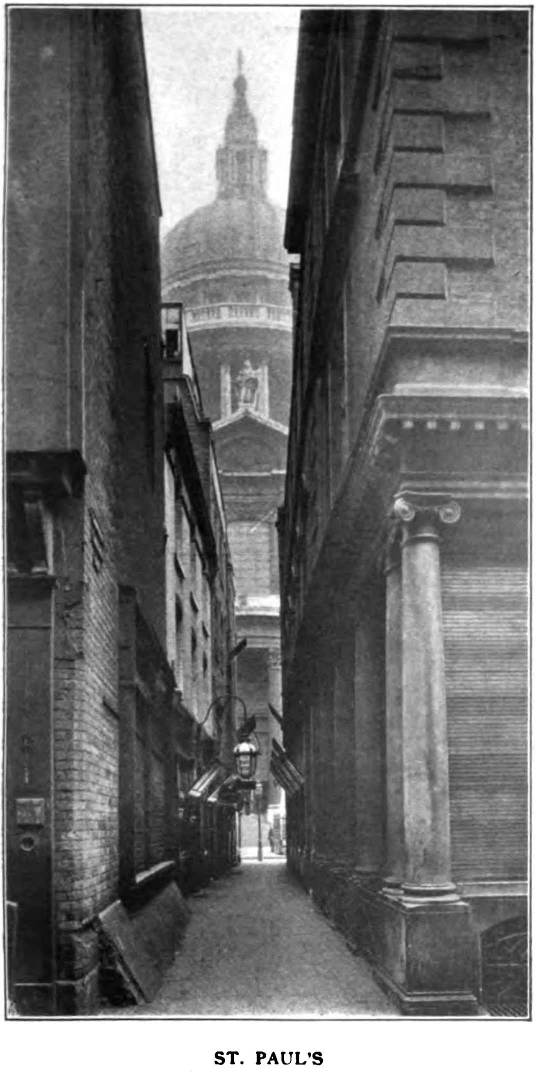
Choice of Time of Day.

It will be seen from an examination of the work of those who have been most successful in street photography that a large measure of their success is due to the happy choice they have made in the matter of lighting. If one will go out into the street after a shower, when the sun is barely shining through the clouds, and look up the street in the direction of the sun, he will see that the reflections are quite striking and oftimes beautiful. Now turn your back on the sun and look in the opposite direction, and most of the beauty of the reflections will vanish. This physical fact can be used to great advantage in street photography, but particularly on wet days. Knowing that the reflections are always best when we look toward the main source of the incident light, we should choose the time of day and point of view to suit. The man who goes about snapping at everything he sees, regardless of the position of the sun, will only make a good photograph by accident. There is a common fallacy that the sun must be behind the camera when we take a picture. On the contrary, there are few cases when the sun, if visible, should not be rather to the front, care being taken to protect the lens from its direct rays. If anyone wishes to realize this fully, let him walk around a tree with bare branches, with the sun low in the sky. With the sun full on the tree there is no beauty in it, but as we get around it to an angle of 90 degrees with our first position, we see that its front is now bathed in light, while the opposite side is in deep shadow, and each little twig and branch stands out with beautiful distinctness and contrast of light and shade. The same rule holds with everything we photograph,—buildings, people, monuments, etc. We should always choose our point of view with reference to the direction of the light; otherwise we lose light and shade entirely, and our pictures become mere matters of line, and without pleasing contrast.

Secrecy and Rapidity of Movement.

Two points need careful attention in street views which include figures, groups or action. The first is, that the photographer must learn to work quickly; the second is, the necessity of a certain amount of secrecy. It is a big advantage to be able to take in a happy situation at a glance, to get the scene on the finder, and, therefore, on the plate, without elaborate or deliberate preparation, and to make the exposure before anyone in the view has become aware of the presence of the photographer. The two points go together in practical work, and their sole object is to get views of life as we see it, rather than views in which attention is being given to the photographer and his work. It is not suggested, of course, that the camera should be hidden or disguised in any way, or that the photographer should prowl about in a mysterious way: simply that he should make himself so familiar with his instrument and its handling as to be able to make quick exposures without drawing attention to what he is doing.

This is merely a matter of home practice, and those who want to succeed in street work should put themselves through a systematic course of drill. Learn the working of all parts of your camera; how to level it quickly in approaching an object; how to "find" and adjust what you desire on your plate, and how to make the exposure the moment you have what you want before the lens. The way in which most amateurs ostentatiously or nervously display themselves when photographing on the streets is often ludicrous in the extreme, and necessarily fatal to the purpose they have in view. So, let the main rule be to attract as little attention in preparing for an exposure, or changing plates or film, as is possible. It is simply a matter of practice and dexterity in mechanical movement, in per-



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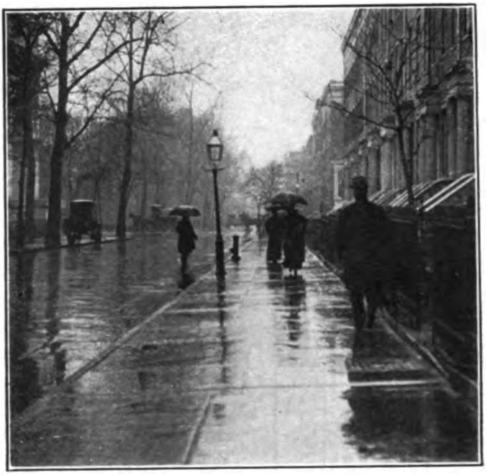
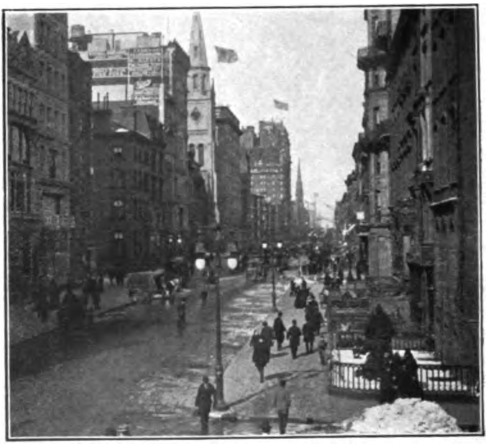
Freeman Dovaston





North side of Washington Square: New York
Fifth Avenue (N.): New York
John Beeby

ception of what is on the finder, and of instant action in touching the shutter at the right moment. Do not carry the camera always in position for exposure; learn to keep it at your side, to raise it when occasion requires, and make the exposure. Then drop it again, and turn in some other direction while you prepare for a new exposure.

The less the camera is in evidence the better. If the views we get show people looking at the camera, they thereby lose the interest which attaches to a view where people are unconscious of the camera—just as we see them in our walks abroad. Let us take an instance. We have a group of boys playing "craps" or a "game of marbles." They are intently absorbed in the game, and make up an interesting bit of street life. The moment they become aware of the photographer's presence, interest in the game ceases; most of the boys will be staring at the camera, the others will be posing, and the view is ruined.

It is astonishing how practice makes perfect in handling the camera in the streets, as here suggested. If the reader will go through the operations necessary to leveling, finding and exposing at this moment, he will be surprised to observe how slowly he moves, mentally and mechanically. A time test, after a week's steady practice, will show a wonderful gain in quickness. The practical result is that his views will lose their photographic look, and he will be able to get many scenes not possible to the worker hampered by awkwardness and slowness of movement caused by lack of practice.

Holding the Camera. Another interesting point concerns holding the camera in street work. Most of the street pictures I see show that they were taken from too low a point of view. We do not see things from a point less than four feet above the ground, yet the majority of hand-camera workers persist in holding the camera at that height. The proper place is against the chest, as high as we can manage it, and see what is on the finder. Sometimes it is necessary to hold the instrument against or above the head, as in getting a view of an ambulance call, or of a fire scene over the heads of a crowd. With box-cameras, offering something around which the arm fits comfortably, a good position is well up under the arm. This steadies the camera against the side of the body, and leaves one hand free for its manipulation or other uses—a decided advantage. In whatever position we hold the camera, however, steadiness and quickness of action are the two points of chief attention, and both are not difficult to master if we can manage a reasonable amount of home practice before venturing into the streets or public places.

Moving Objects. So far nothing has been said about the difficulty of photographing moving objects, and that is one of the first and greatest that the street photographer will meet. There are a number of tables to be found in the annuals, all scientifically calculated, but those who rely implicitly upon them will be likely to give up street photography in disgust. These tables call for a certain speed for a man walking, a shorter exposure to be given if his legs are in motion. As I was never able to find a man walking without his legs in motion, I long ago learned to take chances on them as I found them, and leave further search to others. Among the early surprises in my experience in street photography was the discovery that with a $\frac{1}{15}$ second shutter-speed I could take pictures of men walking, who, as the tables told me, were at least half a mile off, but who, by actual measurement, were not over a hundred feet away. After a while I began to find that I had caught trolley cars, which the tables told me were either a mile and a half away or were standing still. Then I thought it time to test my shutter, but found that if the tables were right all the speed testers were wrong. Again, though, I have tried to take trotting horses with my fastest shutter-speeds, and at the distances authorized by the tables (not counting for legs), and have found that beyond getting a modern Salon picture I had nothing, thus showing beyond any doubt that the estimates of the tables were conservative. Such being my own experience, I will vouch for no tables, though the editor may put one in here if he wishes. All I can say is that there is a great deal in choosing the right moment for taking pictures of moving objects. It frequently happens that by taking advantage of our opportunities we can use a shutter-speed of $\frac{1}{10}$ of a second, when a moment later a speed of $\frac{1}{100}$ second would be too slow. An object coming directly toward the camera will admit of three times the exposure of one going at the same speed at right angles. The shorter the focal length of the lens, the faster can the object move without apparent motion. But even with these few general rules on the subject, the best rule is to wait for the right moment and then snap. While walking around town one day with my box-camera, I turned a corner and nearly ran over a blind beggar sitting against a wall in the sunlight and playing a mournful tune on an accordeon, all the time keeping time with one foot and droning forth a mournful ditty, with head accompaniment.

My fastest available shutter-speed with the lens I had was 1/15 of a second, but just to see what I could do with it I selected my point of view and waited for a cessation of hostilities. I was not over ten feet from my subject, and, fortunately, was not hampered by having with me a table showing the proper distance to get from an accordeon in action. Fig. 6 shows what I got. I took him as he reached a quarter-rest. Much of street photography must be done on the same principle.

It may sometimes happen that, owing to the conditions of weather, or time of day, an exposure of from one-fifth to one-half a second would be required, which with moving objects would be out of the question, and yet the view must be taken. In such a case the difficulty can be overcome by the use of a tripod, a very small stop and a very slow plate, thus bringing the exposure up from one to five minutes, when passing objects will make no impression on the plate. Take, for instance, a view, which, under certain light conditions, will require ¼ second exposure with the No. 8 stop. By cutting the stop down to No. 128 we find that it will require four seconds exposure, but by using a very slow plate, such as Carbutt's B 16, which is one-twentieth the speed of the most rapid, we find that the view will require eighty seconds, or one and one-third minutes. With such an exposure it would be possible for trolley cars to pass the field of view without making the slightest impression on the plate, or for persons to walk in front of the camera, at a shorter distance, without leaving a trace of their passing on the plate. If, however, persons should stop within the field of view, it would be well to cap the lens until they have made up their minds to move on. With some diaphragm shutters it is possible to close the opening much farther than even the No. 256 stop. *Modern Lenses* will show how to calculate the relative exposures for such openings, and it is well to mark them for emergencies such as I have referred to.

Suggestions from an Expert.

The following suggestions and tables may be useful in assisting the reader to get successful negatives of moving objects in the streets. They were compiled by Mr. L. J. R. Holst for the manufacturers of the *Reflex* hand-camera, and represent the sum of several years' work with that instrument. The extract is, of course, printed here by his permission.

"As the elimination of motion is the principal condition for a satisfactory picture of moving objects, it is evident that the first consideration is at what speed a given picture should be taken, and when that point has been settled the working opening of the lens is regulated with due regard to the speed of the plates or film used in connection with the weather, and the time of the day and year.

"Thus let us first find out how to determine the required speed of exposure. Many complicated and embarrassing formulæ dealing with this question have been published, and yet the question is extremely simple.

"It will be easily understood that it is impossible to produce an *absolutely* sharp image of any moving object, as no matter how infinitesimally short the exposure be, the picture will have moved over the plate during the time the shutter exposed it, and consequently the result will be that we get two pictures of the original more or less completely overlapping each other. The first of these pictures is produced at the moment the shutter uncovers the plate, and the last at the moment the plate is covered again. Fortunately, however, it is possible to so closely make these two pictures cover each other that our eye does not *detect* more than one picture, and in order to obtain that effect the difference between the two pictures should not be more than $\frac{1}{100}$ of an inch. This condition is the basis on which all further considerations depend.

"It will be easily understood that we have ultimately to deal with the speed with which the picture travels over the plate, and not with the actual speed of the object. The speed of the picture bears exactly the same relation to the speed of the object as the size of the picture bears to the size of the object. We infer from this that the size of the lens (i. e., its focal length), and its distance from the object enter into the question, since these are the factors which determine the relative size of the object and picture. Since each camera is fitted with one lens, we can consider the focal length to be a constant value and give attention only to the variations in speed, owing to the different distances of the lens from the object.

"The following table gives the proportionate size of object and picture for lenses of different focal length at varying distances :

Focal length of lens	Distances :	10 ft.	15 ft.	20 ft.	25 ft.	50 ft.	100 ft. infinity
6 inches.	Proportions :	1/20	1/30	1/40	1/50	1/100	1/200
7 "	"	1/18	1/27	1/36	1/45	1/90	1/180
8¼ "	"	1/14	1/20	1/28	1/35	1/70	1/140
9¾ "	"	1/12	1/18	1/24	1/30	1/60	1/120
10½ "	"	1/10	1/15	1/20	1/25	1/50	1/100
12 "	"	1/9	1/13	1/18	1/22	1/44	1/90

"For lenses of intermediate foci the values for the next larger lens will apply.

"The next point for consideration is the actual speed of the objects to be photographed, and in dealing with this matter it is sufficient for all practical purposes to classify them as follows:

Subjects	Per hour	Per second
Pedestrians........................	3 miles	52 inches
Hansom cabs, carriages, etc.........	6 "	100 "
Trolley cars in city streets (fast).....	8 "	135 "
Fire engines at full speed...........	9 "	150 "
Bicyclists in city (fast)..............	8 "	135 "
" ordinary speed............	6 "	100 "

"In making use of this table it should be borne in mind that the apparent speed is considerably reduced by the angle under which a moving object approaches or recedes. When that angle is 60 degrees, the apparent speed is just one-half the actual speed.

"The foregoing information will now permit us to determine the required speed of exposure for different lenses and subjects, and the following example will explain how to use the table in the case of an ordinary street scene to be photographed with a lens of 6-inch focus.

"Suppose the picture to contain a trolley car which we catch at 50 feet approximate distance. As this car is the fastest moving object in the picture, the exposure is regulated in accordance.

"We find that the 6-inch lens will draw a picture of $\frac{1}{100}$ of the actual size of any object at 50 feet distance. The picture will thus also move over the plate with a speed equal to $\frac{1}{100}$ of the actual speed of the car, which we assume to be 135 inches per second. As the car approaches us under an angle of 60 degrees or less, we may reduce the apparent speed to one-half the actual speed, which leads to the result that the picture moves at the rate of $\frac{135}{2} \times \frac{1}{100} = 0.675$ inches per second over the plate. As this amount of motion is 67.5 times greater than what may be allowed for a sharp picture, it is evident that an exposure of $\frac{1}{67.5}$, or say $\frac{1}{68}$ second, will give the desired effect.

"Having thus ascertained the maximum exposure which will give a sharp picture, we can proceed to find at which opening we should adjust the diaphragm. Assuming that the most rapid kind of plates be used, we decide this matter by consulting the exposure table given on a previous page. As this table is arranged to indicate the required exposures for a given opening, we simply have to work backward and find which opening is given for the exposure already decided on."

Unequal Lighting and Development. Another difficulty in street photography already referred to is that of unequal lighting and consequent sharp contrasts between light and shadow. In nature one of the greatest charms of street life lies in this very condition, but in photographs it is difficult to preserve, as in printing we lose in a large degree both the luminosity of the high lights and the translucency of the shadows.

I have already laid down the cardinal rule of exposure, which is "Expose for the shadows, and let the high lights take care of themselves," but this rule presupposes a knowledge of development. For in development we must follow the converse of the rule, and develop for the high lights and let the shadows take care of themselves. In a properly exposed plate, and with a properly constituted developer, such treatment will result in a perfectly well-balanced negative, for the shadows will have received exposure sufficient to enable them to acquire the necessary density by the time the high lights have reached theirs. Fortunately the photographic plate possesses great latitude in matters of exposure, and it is possible, by careful development, to secure a good negative from a plate parts of which have received eight or ten times the proper exposure. But in street work it is not probable that any portion of the plate will ever receive more than four or five times the proper exposure, and this amount is well within the latitude of the plate, even with ordinary development. The development of a properly exposed plate will proceed regularly in the normal developer, even though the view contained a large proportion of shadows and some very high lights, and if development be stopped as soon as the high lights have reached their proper printing density, the plate will come from the fixing bath with shadows full of detail and the proper gradations. But if the plate be developed for the shadows, the high lights will be so dense that subsequent reduction will be necessary before the negative can be printed from. Thus prolonged development in the normal developer only does harm, as the density of the high lights increases much faster than that of the shadows, and, instead of getting nearer together, they are all the time getting farther apart.

It is in under-exposed plates that the tendency to develop for the shadows is most evident. In such a case we must use a different method of development. It often happens, too, that one knowingly under-exposes his plates in street work rather than go without the picture, or take too many chances on the motion of moving objects. In all cases of under-exposure I have found the best developer one greatly diluted with water. This is far simpler than changing the constituents of the developer, and my own tests have shown it to be equally as effective. The whole object of development in such cases is to overcome the difference between the rate at which the high lights increase in density, and that at which the shadows increase. This can only be done by diminishing in the developer the proportion of the density-giving agent, known as the reducer, which comes in contact with the fully-exposed portions of the plate. And while it takes very little of this agent to bring out the small amount of density required for the detail in the slightly exposed portions of the plate, it takes a great deal of it, comparatively, to bring out the requisite density in the more fully exposed portions. Beyond this it is not necessary to go into the theory of the subject, and it is only necessary to say that, for a slightly under-exposed plate, it is well to add double the quantity of water to the developer; for one rather badly under-exposed it is better to add four times the normal amount of water; and for one very badly under-exposed, as much as twenty times the normal amount of water can be added with advantage. When this is done development becomes very slow, and for this reason there has grown up a system known as tank development, in which plates or films are placed in a covered receptacle filled with a greatly diluted developer, and allowed to remain undisturbed for from five to twenty-four hours. When so developed the plates or films should be placed on edge, as if laid flat staining and unequal development are likely to result. As full directions for tank development may be found in earlier numbers of THE PHOTO-MINIATURE, I will not go into it more fully.

Intensification. Only the necessity of making each number of THE PHOTO-MINIATURE in a measure complete in itself induces me to go into the subject of development and those of a kindred nature. But it will frequently happen that a slightly under-exposed and properly developed negative will be too thin for printing on a chosen medium, and intensification of some kind then becomes necessary. There are a great many methods of intensification, almost any of which will suffice for work of this character, but it is my purpose to give but one, and that probably the most simple. The plate to be intensified, after being thoroughly freed from hypo, is first immersed in water until the film is thoroughly soaked. It is then placed in a solution of sixty grains of bichloride of mercury to six ounces of water and left for five to ten minutes, or until the film becomes thoroughly bleached through to the glass. It is next thoroughly washed in running water, and upon this washing depends the permanency of the plate after the process is complete. Finally it is placed in the developing tray, and flooded with any full-strength developer. It will rapidly gain density, and come from the developer a much better printing negative than it was before. Finally it is washed thoroughly to eliminate all traces of the developer, and dried in the usual way. If still too weak the process can be repeated, and it will be found to gain density each time. It may sometimes happen that after the first intensification the negative is still weak. If there is danger of this it is well, instead of flooding it with the normal developer, to use a developer made up of five or ten grains of pyro and an equal amount of carbonate of soda to four ounces of water. This will result in a staining of the film and a slow printing negative with clear high lights.

Reduction. Where an under-exposed negative has been carried too far in the developer and the high lights are too dense, these latter can be reduced and better relative values secured by immersing, after thoroughly eliminating the hypo, in a 3 to 5 per cent solution of persulphate of ammonia. The action of this can be stopped by flooding the plate with a 10 per cent solution of sulphite of soda, the plate being rubbed with the fingers when first put in the sulphite solution to enable the latter to reach all parts of the film at one time. Otherwise the action may continue for some time and the plate be ruined. The plate must then be thoroughly washed. If a plate has been over-exposed it should be very fully developed, the denser the better. If very dense and the contrasts seem to be proper, it can be reduced rather uniformly by immersion in a solution of a few drops of a saturated solution of red prussiate of potash in a fresh hypo bath. Reduction in such a case must be very slow, and may require half an hour or more, the tray being rocked from time to time. If, after very full development, the negative still appears flat, though dense, the better plan is to reduce it in a very much stronger solution of the potash solution in the hypo bath. This cuts out the shadows more rapidly than the high lights, and often results in a very good negative.

Enlarging. As in all other branches of photography, much of the pleasure derived from pictures of street scenes depends upon their subsequent treatment. I have already referred to the necessity of trimming many of them to their proper proportions and dimensions. This necessity of itself frequently precludes the possibility of using them as finished photographs, as a 4 x 5 negative will frequently furnish a print not over an inch and a half or two inches in its longest dimensions. By enlarging such sections of the negative as may be wanted, a series of prints of uniform dimensions may be secured, and it will be found, when so treated, that many of them will be the most interesting pictures in one's collection. I myself keep my collection in an 8 x 10 portfolio, the desired portions of the negatives having been enlarged so as to cover only a section of an 8 x 10 sheet of bromide paper. By the use of masks over the bromide paper on the easel, only the desired portion appears on the finished print, and that section is placed as carefully as I would place a print in mounting.

Stereoscopic Street Pictures. Were I about to take a European trip, and could take with me but one outfit, I should unhesitatingly choose my stereoscopic camera. For landscape work I do not fancy the stereoscopic pictures very much, but for street scenes it is preëminently suitable. When we see a picture of a person through the stereoscope, we can almost feel that he is standing before us. That is the feeling which we wish to produce in the minds of our friends when we bring home our pictures. No other method is half so adequate. The subject of stereoscopic photography has been so exhaustively treated in a preceding number of THE PHOTO-MINIATURE that I can say nothing further on it, except to add my recommendation that it be given an intelligent trial.

Snow Scenes. In my tables on exposure it will be noticed that I call for one-fourth the normal exposure for snow scenes. This rule is not strictly applicable to street photography. It is true that the presence of snow in any quantity causes the reflected light to be much stronger than it would be without it, but in dealing with subjects including buildings or trees in shadow, very little allowance can be made for this factor. It is well to bear it in mind, but do not allow too much for it. In my own experience in snow photography, I have found that the best results are obtained with backed isochromatic plates, ray-filter, full exposure for the dark objects, and a half-strength developer fully restrained with bromide of potassium. This gives full gradations in the snow with dense high lights if development be carried far enough, and at the same time ample exposure for the darker objects. The method, so far as I know, is my own, and is the result of much thought and many experiments. Where it is not convenient to use the ray-filter, fairly good results can be achieved if the plates are backed and exposed and developed as stated. Of course, when the sun is full on the view and there are no deep shadows or very dark objects, we can cut the exposure down considerably. It is almost as difficult to under-expose in such cases as it is to over-expose in certain classes of interiors.

Wet Day Photography. One of the most delightful branches of street photography is that which has come to be known as "wet day photography." Nearly all of the street photographs that we see at the exhibitions are of this class, and the field is very wide. We will naturally prefer a view where the reflections are at their best, and streets having asphalt or similar pavements are, therefore, usually chosen. The exposure will, of course, vary with the strength of the light prevailing. If there is plenty of light but no shadows, multiply the normal exposure by 2. If misty and dull, multiply by 4, and if raining and very dull, multiply by 8 or 10. As every dull day is different, no precise rule can be given. Under-exposure, before everything else, is to be guarded against. Needless to say, one should be very careful with his camera under such conditions. The metal parts should be wiped over with an oiled rag both before and after using in order to prevent rust. Care must also be taken that moisture does not condense upon the surfaces of the lens. For this reason a shutter working in front of the lens is to be preferred. If otherwise, use a lens-cap and wipe the exposed surface of the lens from time to time with a piece of soft dry linen. If some such precaution is not taken, many pictures will be lost. In developing this class of pictures, a weak developer should be used, i. e., one diluted with from two to four times the normal quantity of water, as the effect of such development is to produce the softness more in keeping with the nature of such subjects.

Buildings. Concerning the photographing of buildings, little need be said here, the subject requiring a Miniature to itself. But with the camera which one will ordinarily use in street work, it is a mistake to undertake to photograph an entire building unless under particularly favorable circumstances. In the absence of a swing-back and rising front, particularly, is it unadvisable.

It is far better to satisfy oneself with just a bit of the building, always choosing its most distinctive feature. This enables one to give full importance to the detail on a small plate, while if the whole building be attempted, the detail would be practically lost. I have seen many beautiful photographs of sections of buildings in Paris, London and other European cities taken in this way on 3½ x 3½ films, and they are far more satisfying than the crude pictures of the entire buildings taken with the same camera.

Street Photography at Night.

Street photography at night may be of either one of two classes,—pictures taken by artificial light alone, or those taken in moonlight. The essentials in the former case, especially if street-lights are to be included, are backed plates, sensitive to the yellow rays, or, in other words, isochromatic or orthochromatic plates. The ordinary non-halation plate may be used, but requires a much longer exposure. Night scenes by artificial light are usually taken, and are always at their best, on rainy nights. This gives full play to the reflections on the pavement, which are always their most attractive feature. The exposure with f/8 stop may vary from thirty seconds to thirty minutes or more. The former will give a fair range of values in the reflections, but will leave the shadows utterly black. A longer exposure will give a better range of values and will enable the worker to preserve some detail in the darker portions of the view. Development should be with a diluted developer.

For a moonlight exposure pure and simple a full half hour's exposure is required with the f/8 or No. 4 stop. That it is done frequently in less time does not alter the fact. Fig. 7 is a moonlight picture taken after dark by the light of the full moon, and no other illuminant. It was given a half hour's exposure with the f/11 or No. 8 stop, and is under-exposed. I use it in order to show the effect of developing for the high lights alone in this, as well as in other classes of pictures. A close inspection of the picture under a glass will show the detail in the lace curtains at the windows. These windows, illuminated from within by incandescent electric lights, were over-exposed nearly one hundred times, but the detail is there. A still closer inspection, if it is not lost in the reproduction, will show a parlor lamp behind the large window in the front of the house. The plate was developed with the express view of saving the details referred to. If, in so doing, the shadows are too dense, we may know that we have under-exposed. In this case I used a ready-made developer diluted with four times the normal quantity of water.

Here, perhaps to the reader's relief, our street excursions end for the present. The use of the camera in the streets is a subject about which it would be easy to write a good-sized book, but it is perhaps wiser to leave the individual worker an amount of scope for his own opinion concerning many details. My endeavor has been to explain a few things thoroughly, and to put a good reason behind my explanation, rather than to gloss over a multitude of loose facts. As far as my experience goes, the problem of exposure is the great stumbling block with most amateurs, and this I have given chief place in my treatment of the subject. The rules of photography are legion, and the opportunities for difference of opinion in practice are not less numerous, but the underlying principles involved throughout are few. By familiarizing ourselves with these few fundamentals we are preparing ourselves to become skilful workers; by blindly going ahead without the guidance of these principles we can never be aught but experimenters.

Acknowledgment. Those familiar with recent photographic journalism have doubtless ere this recognized the personality which crops out here and there in this digest of information concerning street photography. It was written by Mr. Osborne I. Yellott, and presents, for the most part, his experience in this interesting field of work. The help of those who sent examples of their work for the illustration of the text is herein also acknowledged with thanks. Their names are duly handed down to posterity beneath the titles of the pictures.

BOOKS.

There are no books published dealing exclusively with street photography, but the following contain useful information on the subject, dealing with it in an indirect rather than in a direct way:

New Pointers. By Geo. E. Mellen, expert. 1900. 20 cents.

Instantaneous Photography. By Capt. Abney. 1896. 75 cents.

The Use of the Hand-Camera. By Clive Holland. 1898. $1.20.

The Hand-Camera and How to Use It. By W. D. Welford. 50 cents.

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NOTES.

According to the will of the late C. Piazzi Smyth, one time Astronomer Royal for Scotland, all his negatives are given to the Royal Society of Edinburgh. Among these negatives are several hundred records of cloud-forms, made during Mr. Smyth's travels in various parts of the world. Some years ago we had an opportunity of looking over one of a series of bulky volumes in which Mr. Smyth kept prints from these cloudland negatives, and the treat was one to be remembered. Each print was accompanied by scientific data, making the record a valuable one to students of meteorology. If we remember aright, a duplicate volume of the series came into the possession of Mr. Edward L. Wilson, of *Wilson's Photographic Magazine*, and a review of its contents, from the pen of Dr. John Nicol, may be found in the May (1896) number of that magazine.

◆

A few copies of the latest (tenth) edition of Abney's *Instruction in Photography* are being imported from England, and those desiring copies will do well to place an early order with the publishers of THE PHOTO-MINIATURE. The book was noticed in our last number and the price, not there given, is $2.50, postpaid.

◆

We are informed that by substituting an oxalate of ammonia bath, consisting of 2 ounces of oxalate of ammonia in 40 ounces of water, for the third (and last) acid bath generally used in clearing platinotypes, a blue-black tone is secured, and the last traces of iron are completely removed from the print. The hint comes from Mr. J. E. Watson, an expert platinotype printer, of this city.

The new reprint of *Platinotype Processes*, being No. 7 of THE PHOTO-MINIATURE, is now ready for delivery.

◆

The Chicago Society of Amateur Photographers proposes to hold a Photographic Trades' Exhibition in

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Chicago, August 27 to September 1, inclusive. The object of this exhibition is to call attention to the great improvements which have been made in photographic apparatus and materials, as well as the best work of photographers along professional, commercial, scientific and amateur lines.

Special attractions are being arranged to draw the attendance of the public, and the fact that there are over 60,000 amateurs in Chicago alone should ensure the success of the exhibition. Full particulars, rates for transportation, etc., may be obtained on application to the Chicago Society of Amateur Photographers, Art Institute, Chicago.

The scheme is an excellent one, and we hope it will be well supported by the trade and all interested in the development of American photography.

◆

Mr. C. P. Goerz, 52 Union Square, New York, advises us that he has considerably enlarged his premises, and is now able to display his large stock of *Double Anastigmats*, *Treider Binoculars*, etc., to much better advantage than formerly. Visitors to New York are invited to call at the Goerz sales-room, where they will find many things of photographic interest worth the seeing.

◆

Ammonium persulphate has been so much written about of late that many photographers doubtless think of it as something new in photographic practice. But its use as a reducer for negatives, to clear pyro-stain from a discolored negative, or from the fingers, was spoken of by R. Ed. Liesegang fully three years ago.

◆

We have received from Dr. Louis A. Weigel, Rochester, N. Y., a valuable and profusely illustrated paper, titled "Practical Points on the Use of the X-Ray." The paper, which is reprinted from the *Philadelphia Medical Journal* (special X-Ray number, January 6, 1900), deals very completely with the details of photographic manipulation involved.

◆

An ingenious print trimmer has just been put on the market by H. A. Hyatt, of St. Louis. It is known as the *Nicholson Trimmer* for oval and circular prints, and

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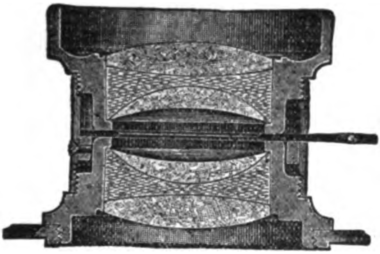

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trims the print so that a narrow white border encircles it, of absolutely uniform width, with but one cutting form. The new trimmer is in all essential features, except the cutting wheel, similar to the revolving trimmers in general use.

Mr. Hyatt also sends a copy of his new *Amateur Catalogue*, No. 102, offering 96 pages quarto, bristling with attractive specialties intended to lighten the amateur's burdens. A copy may be obtained, by sending 4 cents to cover postage, from Mr. Hyatt, addressed as above.

◆

The *Journal* of the Photographic Society of Philadelphia last issued (April) contains an interesting paper on "Telephotography," by the Rev. Frank S. Dobbins. We regret that the nature of the paper does not permit of condensation and cannot, therefore, be more than mentioned here. Those who cannot obtain a copy of the *Journal* will, however, find the paper reprinted in the July number of *Wilson's Photographic Magazine*.

In the same number of the *Journal* is published a report upon "Phosphate of Silver Printing Papers," by George D. Firmin. This we reprint, as supplementing our note on the subject at page 43 of our last number:

"The Technical Committee has referred to me the investigation of the silver phosphate method of making prints. The members of the Society will remember that at a recent wall display two of Mrs. Käsebier's pictures created considerable comment, favorable and otherwise. They were made (so we were told) by 'an entirely new process or emulsion'—phosphate of silver. Phosphate of silver is not by any means new as a sensitizer for printing papers. It was used early in the fifties. The present method is new only in so much as it calls for the use of an organic acid (tartaric or citric) in addition to the silver salt. In a recent magazine article upon the subject it was stated that 'it was made from silver nitrate, precipitated as phosphate by di-sodium-hydrogen phosphate (Na_2HPO_4). To this well-washed precipitate is added tartaric acid solution to form an *emulsion*. This is smeared over the paper with a tuft of cotton or sponge.'

"I made a number of attempts, but could obtain no *emulsion*. The silver phosphate dissolved to a clear solution. This is silver tartrate in solution, and free phosphoric acid.

"When this paper is exposed under a negative we obtain a print. The paper was said to be a quick printer,

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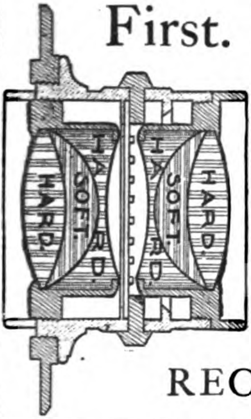

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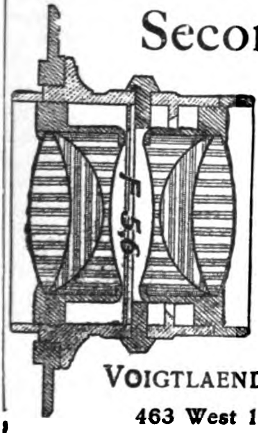

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It required in bright sunlight twenty-eight hours to make one print from a weak negative, and about a week from a dense negative. This printed all day—also all night! This paper was not sized and the image was very much 'sunk in'—flat and very poor. I thought sizing the paper might help, so I sized some with arrowroot, worked out a few more chemical reactions, made up some more solution, coated the paper, and obtained prints quite different from the first. They look like very poor, ordinary silver prints—waste-basket prints. Some of my prints when viewed by very bright transmitted light are not so bad. So much for the paper coated by myself.

"I have some paper which I received from New York, and which acts very differently. This has been sized with albumen, which keeps the emulsion more on the surface. It prints with fair negatives in sunlight in from two to seven minutes. Some of it is unevenly coated, which accounts for the streaks in some of the prints shown. Some of the coating is on ordinary charcoal paper, which has a very nice, grained surface, but is difficult to work without tearing, as it becomes very flimsy when wet.

"Personally I cannot see any advantage in the silver phosphate paper over any of the ordinary silver papers on the market. It does not compare with carbon, gum-bichromate or platinum. The glossy surface is objectionable."

A translation of the chief part of Professor Valenta's experiments with this paper, from the *Photographische Correspondenz*, appeared in *Photography*, June 7.

◆

Annual Outing of the Amateurs' Institute of Photography.—It is proposed to arrange for a six-days' photographic trip over the picturesque Chesapeake and Ohio railroad, available for all the members of the above Institute and their friends, during August, in a special train of Pullman sleeping cars, with baggage car attached, in which latter will be provided a dark room for changing plates and accommodations for photographic impedimenta. The train will be the home of the party from the time of leaving until its return to New York, with the exception that all meals will be served at the best hotels of the several famous resorts visited. The train will make stop-overs at various attractive points, among which will be Virginia Hot Springs, Warm Sulphur Springs, White

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The excursion furnishes a pleasant chance to get negatives of much of the delightful scenery of West Virginia, and will doubtless be taken advantage of by many amateurs who can arrange for the necessary time in August. A circular with full information may be obtained on application to Messrs. E. & H. T. Anthony & Co., New York.

◆

Acting upon a suggestion from G. Gennert, the American agent for Ortol, we have recently used this comparatively new developer for developing Velox and other gaslight papers. In many respects, but especially in the quality of the brown-black tone it gives, Ortol is decidedly superior to amidol for these papers. A set of Ortol tubes, which are usually made up to 40 ounces of developer for negative-making, should, for developing gaslight papers, be diluted to make 240 ounces of developer. In other words, make the solution as usual for negatives and dilute 1 ounce of this with five times its bulk of water for Velox, etc.

◆

In response to the growing demand for high-grade lenses for use with the popular styles of hand-cameras, the Voigtlaender & Son Optical Co., of New York, are now now fitting their Collinear lenses to many of the best-known hand-cameras. The Collinears are so constructed that the flange is quite close to the shutter, enabling them to be used even with the most compact of cycle cameras. The Series II Collinears, we are informed, are in great request for use with long-focus cameras, such as the *Long-Focus Premo*, *Montauk*, *Graphic* and *Kodak*. This series is especially adapted to the *Cartridge Kodaks* Nos. 4 and 5, while Series III is equally suited for use with the *Folding Pocket Kodak*, *Special Bullet* and *Bull's Eye*. The improvement of hand-cameras by this addition of

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◆

The editor of *Photography* (London) has "done" the Paris Exposition photographically, and some of his comments are interesting, especially concerning the American display. We are surprised that one who should be better informed should have imagined that the American exhibit of portraiture there shown was in any sense "representative." We extract a portion of his report:

"The United States are fortunate in having one of the finest 'pitches' in the building, and the exhibitors have been alert to take full advantage of it. The visitor who passes in at the doorway we have recommended and goes straight down the thoroughfare shown in our sketch will not fail to observe the Stars and Stripes hanging out over the passers-by, long before he reaches the particular section they adorn. On drawing nearer, it will be seen that a long, handsome colonnade in white and gold, with a frieze and cornice of similar appearance, connects up, or rather hides, a series of the plain iron columns and girders of the building. The intervals between the columns are occupied by exhibits, and at the angle nearest the British section is to be found that of Kodak, Ltd. The most prominent object of all, a bicycle, bearing the advice 'Never cycle without a Kodak.' Views of the various works and depots of the Eastman Co. were displayed on a pillar. Kodaks of all patterns were to be seen. . . . . . . Included in the Kodak exhibit are goods by the following firms: The American Aristotype Co., of Jamestown, N. Y.; the Nepera Chemical Co.; the Photo Materials Co., of Rochester, N. Y.; the Bausch & Lomb Optical Co., and Warner & Swasey, of Cleveland, Ohio. Behind the exhibit, on a series of screens, was what we take to be a collection of representative American professional photography.

"There was a great deal here which, to be frank, we do not admire at all, but rather condemn. We saw nothing quite as bad as the example we reproduce with a criticism, but we saw quite enough to convince us that professional photography on the whole was, as far as America is concerned, almost hopeless. Attitudes which it is the very

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flattery of suppleness to describe as wooden, retouching carried to such a pitch that complexions in their regularity of pencil dots resemble egg shells rather than a surface of human skin, lighting as false as studio blinds screening indiscriminately the distance and near objects on a painted background can well make it—all this and more is to be seen amongst these photographs. It is a great pity, because here and there amongst the many, are a few examples of really good, honest portraiture—not great epoch-making work, but at any rate straightforward photography to which a captious critic can take little or no exception.

"Unfortunately, all good, bad and indifferent are mingled together so indiscriminately that the labor of wading through the whole collection to find those really worthy of careful study will deter many. Amongst others we noticed the exhibits of Schumacher, of Los Angeles, Cal.; Joseph Byron, of New York, who shows some very good flashlight work; W. N. Brenner, who has firelight studies which are distinctly effective and novel, and some pictures from the 'Baker Art Gallery.'

"The Austrian exhibits will be found immediately opposite the Kodak Company. Entering out of the main gangway is a little room in which is a representative exhibit from the Camera Club of Vienna. This collection only contains fourteen pictures altogether, made up by Philipp Von Schoeller (eight), Baron A. Liebeg (two), Dr. Henneberg (two) and Professor Watzek and Dr. Spitzer (one each). Taken altogether, this little alcove is really the gem of the entire exhibition, photographically speaking. Every picture that it contains, with perhaps the single exception of Baron Liebeg's landscape, is in itself a masterpiece. This we freely admit, without at the same time expressing our entire approval of all. A portrait by Schoeller, which, we fancy, we have seen at the Dudley Gallery, the fine-bearded head of a sailor, full face, was without exception the most striking piece of portraiture we saw at Paris. The Japanese collection included beautiful specimens of photographs on metal, together with a number of examples of professional work, portraiture and landscape—the latter very fine, the former we do not consider as anything out of the common. In the Italian exhibit are to be seen prints which are imitation lamplight effects, portraits really made with daylight by directing it, by means of a system of mirrors or otherwise, so as to appear to issue from the lamp. They struck us as an example of misplaced ingenuity. They were shown by Alinari Brothers, of Florence. Some fine copies of pictures and Venetian views by C. Naya, of Venice,

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will attract attention in this section. Murer, of Milan, Comtes Luigi and Joseph di Primoli exhibit work of fair average quality. The photographs on metals by Borlinetto are also worth a glance. In the same neighbourhood will be found professional photographic exhibits from Austria-Hungary, and not far off Boissonas, of Geneva, one of the best known of continental photographers in this country, has a fine collection of his work.

"In the French section the Photo Club of Paris had a large and representative collection, so we heard before visiting the exhibition. Knowing what this institution has done for pictorial photography in France, bearing in mind the beautiful work of Demachy and Puyo with which we are all so familiar, and for which all must entertain a true appreciation, we went to the quarter in which it was to be found, expectant of much. Whether we had allowed our anticipations altogether to outstrip reason, or whether the exhibit is really second-rate, we cannot say. Certainly we were grievously disappointed. The Englishman who thinks of the Photo Club thinks of the two artists we have just named; he is apt to lose sight of the mediocrity with which in any club they must necessarily find themselves diluted. The club has in this exhibit fallen into the old error of our own Royal Photographic Society in admitting too much. Had it exercised that rigorous restraint which the Camera Club of Vienna has done, which is represented by fourteen pictures only, it would perhaps have gone to the other extreme. Something between the two was what was wanted. As it is, we should say there must be in this collection three or four hundred exhibits at least, perhaps as many again. They are mostly in narrow frames, being close together—distractingly close—and the majority are small in size and insignificant in style and subject. The reputation of the club would not have suffered had it been left entirely in the hands of Messrs. Puyo and Demachy. With the exception of their work, we saw very little indeed that called for more than a passing glance.

"The retrospective collection or historical exhibit is to be found in the French section. It struck us as being very limited in point of numbers (it may not have been complete), and hardly what might have been expected. The Royal Photographic Society, if approached, might itself have lent quite double as many objects of interest as are to be seen here; many of them landmarks in the history of photographic progress. An 'instantaneous daguerreotype,' a view of the Pont Neuf taken in 1843, was noticeable. A number of cameras and closed boxes, unlabelled, are doubtless of the greatest historical inter-

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est, although in the absence of any guide it is not easy to say where this lies. We find we made a note of some specimens of the dry collodio-albumen (Taupenot) process and of some prints in colour on fabric. But what attracted our attention may not be equally interesting to others, and each visitor will make his own selection."

◆

Bird Studies with a Camera. With introductory chapters on the outfit and methods of the bird photographer. By Frank M. Chapman, of the American Museum of Natural History. Illustrated from photographs. 218 pp. 5 x 7½ x 1 in. $1.75. New York: D. Appleton & Co.

As an illustration of how photography helps in nature-study, it would be difficult to imagine a more interesting object lesson than that given by Mr. Chapman's latest volume. The account he gives of the many devices needful in photographing birds is at once attractive and profitable, full details being given wherever they can be useful to those desiring to attempt photographic work in this direction. The choice of a lens, for instance, is illustrated by six engravings, showing the results of as many tests, and the advantage of lenses differing in focal length where the original negative is to be enlarged.

The book is written from the point of view that "bird photography does not mean simply photographing birds, but the use of the camera as an aid in depicting the life histories of birds," and forms as happy an introduction to its subject as the amateur in search of a special hobby could desire.

◆

A photographic exhibition of more than usual importance is to be held in Berlin during August, under the patronage of the Emperor and Empress. Particulars may be had from K. Schwier, Weimar, Germany.

◆

Photograms of 1900 is now in active preparation, and those who desire to be represented among "the work of the year," should submit selected examples of their work as early as possible to the Editors of *Photograms*, 6 Farringdon Ave., E. C., London.

Mr. Joseph T. Keiley, of the New York Camera Club, will again have charge of the American section of the book.

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We have received from G. Gennert, 24 East Thirteenth street, New York, copies of his new general catalogue of photographic apparatus and supplies, and the special 1900 catalogue of *Montauk Hand-Cameras*. The latter is an attractive booklet elaborately illustrated with examples of work made with the various styles of the *Montauk* series. Prominent among the novelties is a double extension long-focus cycle camera, exceedingly compact in form, but offering a bellows extension of 18 inches in the 4 x 5 size; 22 inches in the 5 x 7 size, and 26 inches in the 6½ x 8½ inch size. This instrument is fitted with double swings, reversible back, and has a rapid rectilinear lens which yields three separate objectives of different focal lengths. Considering its great usefulness, the camera is a marvel of cheapness at $30 for the 4 x 5 size. The general catalogue has been fully revised and brought to date by the including of many new specialties for which this well-known house has the sole American agency. Readers who would be well informed of what is new and desirable will do well to send five cents for copies of these attractive lists.

◆

The last day for the delivery of pictures to be submitted to the Judges at the forthcoming *Philadelphia Photographic Salon* is October 1. Entry forms and other information may be obtained from the Photographic Society of Philadelphia, 10 South Eighteenth street; or the Pennsylvania Academy of Fine Arts, Philadelphia.

◆

New Pointers for Amateurs in Photography. By George E. Mellen. 70 pp. Illustrated. 3 x 7 in. Third edition (30th thousand). Paper covers. 20 cents. Mellen Mfg. and Pub. Co., Chicago.

Into this unpretentious pocket-book Mr. Mellen has packed more photographic sense than the average amateur can evolve from his personal experience in ten years' work behind the camera. Its literary style is somewhat blunt, to be sure, but the information is very pointed and "touches the spot." Readers of THE PHOTO-MINIATURE who buy a copy on this recommendation will confer a lasting favor upon themselves, and get their money back from every page they read.

◆

Edward W. Newcomb, formerly editor of THE PHOTO-AMERICAN, writes that he has inaugurated a Correspond-

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ence School of Photography in this city, and invites communications from photographers in need of instruction on any special branch of photography. Answers to queries on all subjects, impartial advice on the selection of lenses, apparatus, etc., the construction of studios, and print criticism, all fall within the field of work undertaken by Mr. Newcomb. We know of few men so well equipped for such a work, and hope the venture will be heartily supported.

◆

The developing salts issued for *Platinograph* paper are now put up in an improved form, by which they are protected from deterioration. Prints we have made with this developer seem clearer and brighter than those we obtained upon the first trial of the paper. The use of this paper is very simple, and the effective prints it yields should win for it a large following among Pacific coast amateurs. A sample package, with developer, is offered by the makers for 25 cents. The Platinograph Paper Mfg. Co., Los Angeles, Cal.

◆

For the benefit of those who desire to acquaint themselves with recent French publications dealing with photography, we have obtained a few copies of Gauthier-Villars & Son's latest catalogue, and will be pleased to send a copy to those asking for them before the small supply is exhausted.

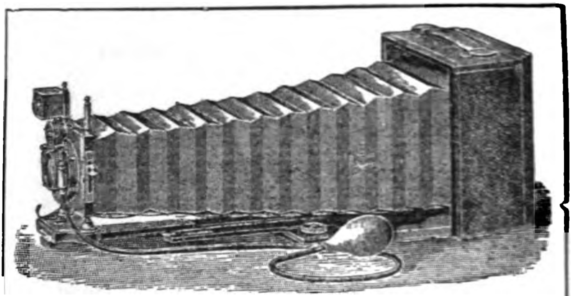
◆

We are glad to see that the *Camera* (Frank V. Chambers, Philadelphia) has met with such success that the subscription price, now 50 cents per year, is to be doubled and made $1 per year after July 1. This little magazine has for some months past offered more and better reading than some of the ten-cent magazines, and is one of the few photographic journals which the progressive amateur cannot afford to miss.

◆

The *Photographic News Year-Book* for 1900 is now ready (in England), and is spoken of with much praise. The principal features are an exhaustive article upon gelatino-chloride paper; another on pictorial composition; and a third on Acetylene. The American edition will, we suppose, be on the market before the end of July.

Mr. G. Gennert, 24 East Thirteenth street, New York, has in past years had the American agency for the *Year-Book*.



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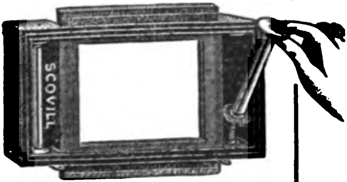

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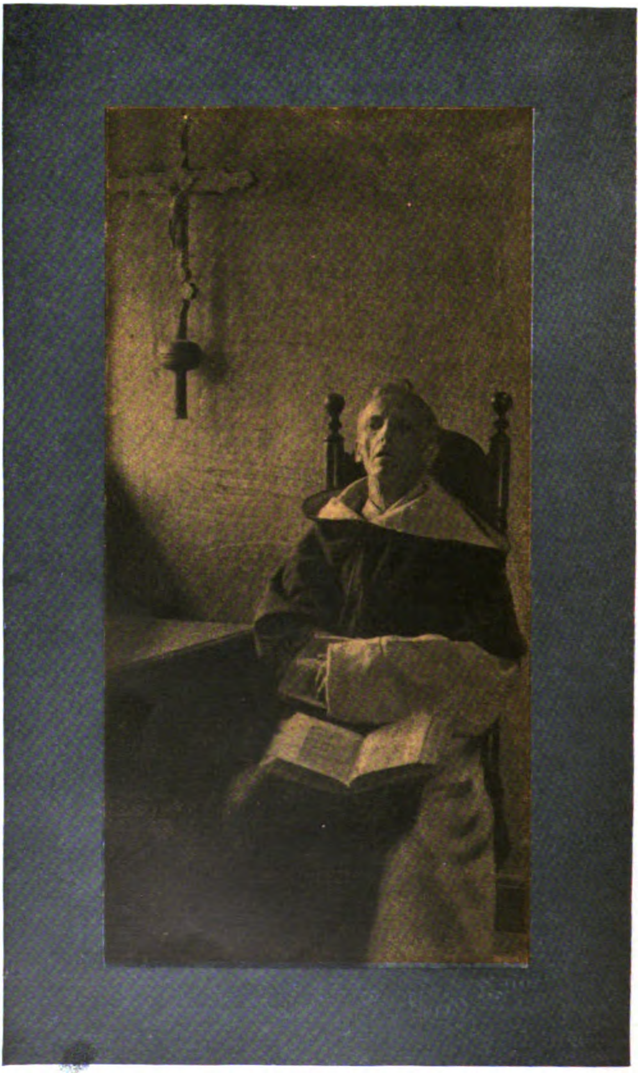
❧

Some time ago, writing from our personal experience, we recommended Forbes' orthochromatic plates for color reproduction. A friend wrote some time after that he had given the plates a trial and was disappointed with the results. Naturally he questioned the recommendation we had given them. Upon placing the complaint before the manufacturers of the plates (Forbes Dry Plate Works, Rochester, N. Y.), they replied that the complaint was somewhat vague, and that their plates almost invariably gave satisfaction and pleasure to the intelligent user. In proof of this they enclosed a few letters, from which we quote: "I have just been using some of your orthochromatic plates which I have had on hand three years, and find them to work splendidly. Please quote price on, etc." This comes from a carpet manufacturer using photography in his business. Another correspondent, well known in the profession, writes: "My best negatives are those made on Forbes' orthochromatic plates." A prominent photo-microscopist writes: "I am using your orthochromatic plates altogether in my work." These, with other opinions, not quoted, confirm our word in favor of the Forbes plate, which we have used for some years, for special work, with unvarying satisfaction.



REQUIES ET LUX
George D. Firmin

THE PHOTO-MINIATURE

A Magazine of Photographic Information

EDITED BY JOHN A. TENNANT

Vol. II JUNE, 1900 No. 15

INTENSIFICATION AND REDUCTION.

Intensification and reduction, as far as we are here concerned with them, are two processes intended for the improvement of the printing quality of negatives. Before we can talk intelligently about them, it is desirable that we should recall a few elementary facts about the photographic negative and its purpose. We have seen in these pages that a "negative" is simply a reversed image, formed of innumerable particles of black metallic silver embedded in a thin film of gelatine. By varying degrees of blackness or density of silver particles (opacity) this negative image represents the different intensities of light and shade in the object photographed. We know that the foundation of the negative is the light-sensitive film on which it is made, and that the essential processes in its making are the exposure and development of the sensitive film. When these three factors—plate or film, exposure and development—are controlled and brought into perfect harmony with each other, the result is a perfect negative: something which very rarely happens! By a perfect negative is here meant one in which all the gradations of light and shade in the subject are proportionately represented by corresponding gradations of density or opacity. Finally we know that the negative is chiefly important as a means of producing prints, a good negative, therefore, being one which will yield desirable prints.

Unfortunately, although there is no lack, either of reliable plates and films for every conceivable purpose, or of information concerning their proper exposure and development, the personal factor, which should control and harmonize all other factors, introduces so many variations that good negatives are by no means as common as they should be. Thus, if we look over our negatives, together with a set of prints from them, we will find few that are really satisfactory, judging them by the prints they give—for which purpose they were made. In the majority we will see that by personal error, in the choice of the plate, in exposure, in development or some other detail, normal conditions were upset, and a good negative was made impossible of attainment by normal processes. Here we see a negative full of detail, but weak or thin in opacity. The contrasts are so weak that it will give only soft, flat prints without force or brilliancy. The errors here were over-exposure and under-development. The remedy is intensification, the strengthening or intensifying of the opacity or contrasts of the negative. In another negative the image has overmuch density, with excessive contrast. The exposure was a trifle short, and the development unduly prolonged, or a developer was used which gave density more rapidly than detail. The remedy here indicated is reduction, the weakening or reducing of the opacity and contrasts in the negative. These are extreme cases. In some negatives we require a little more, or a little less, force in the foreground; or we have a seascape in which the sky and clouds are buried in excessive density. Local intensification or reduction are here suggested. Or it may be that we desire to change the character of a negative, or to modify part of it, to adapt it to a new printing paper, or to secure certain effects. Hence arises the necessity of being familiar with the various methods available, by which a negative, already developed and fixed, may be so changed or modified as to yield more satisfactory prints than could be obtained from it in its original condition or to save a negative otherwise useless.

Definitions.

These methods of after-treatment are as numerous and as diverse as the faults in the negatives which they are designed to remedy. Those most commonly known and practiced may, however, be grouped in two classes: (1) methods of intensification, and (2) methods of reduction, broadly covering the principal defects found in the photographer's negatives. By intensification is meant the strengthening or intensifying of the gradations of density over the whole or part of a negative, so that it will give a more vigorous or more brilliant print, or to gain more detail or contrast. By reduction is meant the weakening or reducing of the opacity of a negative, either generally or locally, as may be required, so that it may print more rapidly, or with more harmonious gradations of tone, or that certain parts may be so reduced in density as to print along with other portions of the negative.

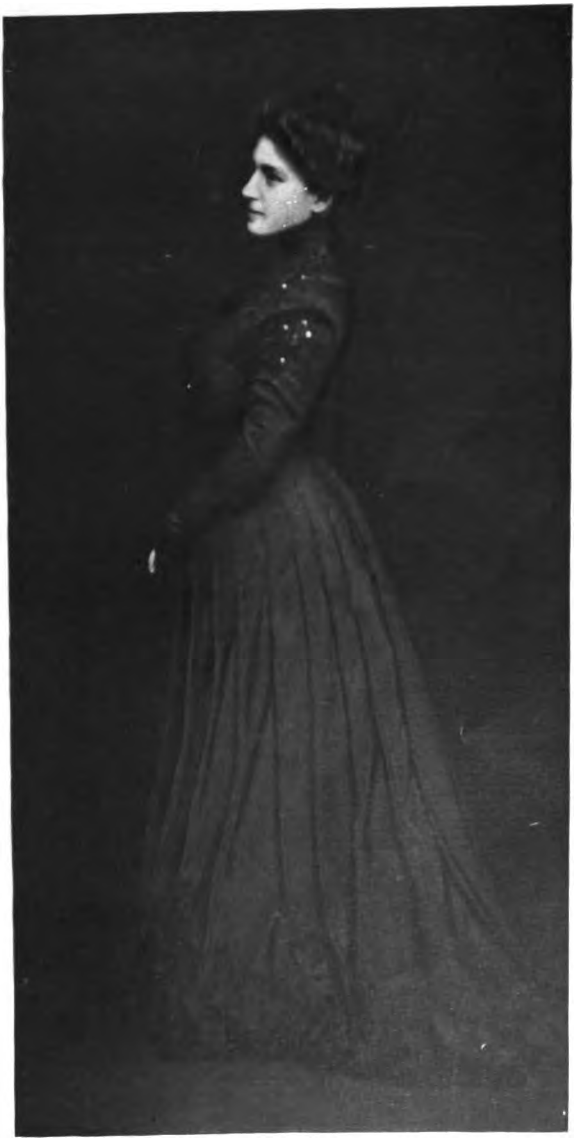
In almost all intensification and reduction processes it is essential to success that the negative under manipulation shall be free from hypo, chemical stains, grease, varnish or other agent in the film which can in any way interfere with the uniform action of the intensifier or reducer employed. The exceptions to this rule will be noted as we go along, but as a general thing the more care we take to ensure that our intensifier or reducer is working upon a simple image of silver in gelatine, the better will we succeed.

Fixing Baths. The greater part of the failures, stains, fog, streaks and other troubles encountered in intensifying or reducing negatives, have their origin in lack of carefulness at the start, and the importance of the thorough preparation of the negative cannot be urged too strongly. When about to intensify or reduce a negative, therefore, first remove all varnish (if it has been varnished) and grease or dirt from the film. If there is any uncertainty as to whether the negative was properly fixed, it is advisable to soak it in water for a few minutes to soften the film, and then refix it as a precautionary measure in a freshly-mixed fixing solution. For the reader's convenience formulæ are here inserted. *Plain Fixing Bath:* Dissolve 1 pound of hypo-soda in 2 quarts of water; or 4 ounces of hypo in a pint of water, according to the bulk of solution needed. An acid fixing bath is preferred by many workers as hardening the gelatine film and clearing the shadows of the negative better than a plain hypo solution. I have used Carbutt's *Acid Fixing Bath* with great content, as follows: Sulphuric acid, 1 dram; hyposulphite of soda, 16 ounces; sulphite of soda, 2 ounces; chrome alum, 1 ounce; warm water, 64 ounces. To prepare this bath conveniently (it will serve the ordinary amateur's needs for a full year), put 48 ounces of warm water into a large bottle, such as those in which mineral waters for table-use are sold, and add the hyposulphite of soda; dissolve the sulphite of soda in 6 ounces of warm water; mix the sulphuric acid with 2 ounces of water and pour slowly into the sulphite solution, after which add to the hyposulphite solution in the large bottle. Now dissolve the chrome alum in 8 ounces of water, and add it to the bulk of the solution, and the bath is ready for use. Fix or refix the negative in this bath by immersing it for fully 15 minutes, then wash for half an hour in running water to clear away the hypo in the film. After the negative is well washed, swab it carefully with a wad of wet cotton to remove any deposit left by the washing water, and place in a tray containing distilled or cold boiled water until ready for intensification, etc.

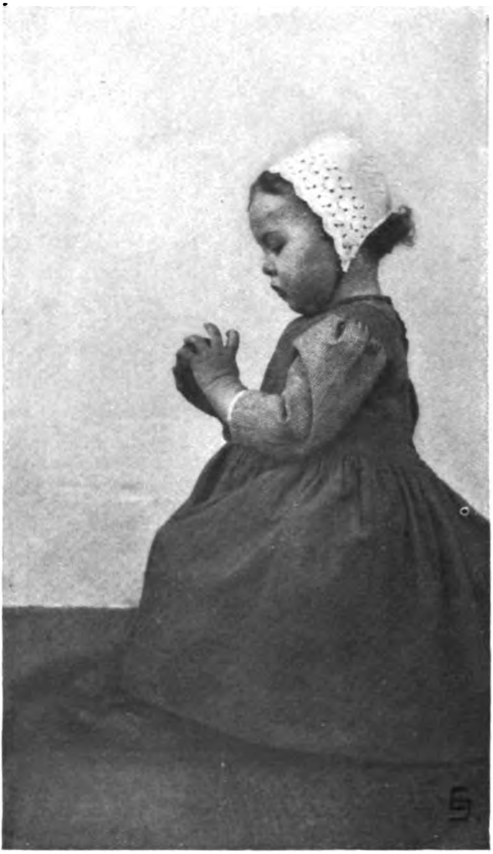
Removing Fog and Stain. In several methods, such as in mercurial intensification, it is absolutely necessary that the negative film be wholly free from any trace of hypo, or stains will result, to the utter ruin of the negative. The best hypo eliminator is a careful washing in a stream of running water, but there are commercial preparations, such as *Hypofoe* and *Anthion*, which are said to do the work with greater certainty.

It is also desirable that negatives which are to be intensified should be, as far as is possible, free from fog or stain caused by prolonged development. Such discolorations may be removed by the use of a clearing bath. A reliable formula is given by Hauff, as follows: Thiocarbamide, 300 grains; citric acid, 150 grains; water, 1 quart. The negative is immersed in this after the usual fixing and washing. When thoroughly cleared, it should be again washed for a short time. Another good clearing bath for removing general fog or yellowness from negatives is as follows: Pulverized alum, 55 grains; water, 20 ounces; to this add, slowly, sulphuric acid, 1 dram.

Iridescent stains or markings on a negative are sometimes the result of overmuch ammonia in the developer, or perhaps they indicate stale plates. They are easily removed by gentle rubbing with a soft rag, wetted with wood alcohol. The impress of printers' ink, caused by packing plates between sheets of printed matter, can generally be removed by rubbing with a wad of cotton wetted with benzine. Silver stains on the negative film are not so easy to manage, but should be removed if at all possible. Todd gives the following method: Soak the plate for five minutes in clean water; meanwhile make a solution of iodide of potassium, 40 grains; water, 2 ounces. Put the negative in this for ten minutes or longer, according to the character or age of the stains. Now make a solution of 1 dram of potassium cyanide (*poison*) in 2 ounces of water. Flow this over the plate, and gently rub the stains with a wad of cotton until they are cleared away. Another method, much used in Europe, may be given as an alternative. To 6 ounces of wood alcohol add a few flakes of iodine, just sufficient to give the alcohol a yellowish color. Immerse the stained plate in this until the stains change to a yellow color, rocking the tray occasionally to facilitate this change. By transferring the negative to a freshly mixed fixing bath, the stains will (more or less) disappear. If the first attempt does not thoroughly clear the stains, the



By D. D. Spellman



CHILD WITH APPLE
Ema Spencer
Philadelphia Salon, 1899. Chicago Salon, 1900

plate should be well washed, and the process repeated.

Having thus disposed of the preliminaries, we can now take up the practical working of intensification and reduction methods, giving our attention first to the methods employed to strengthen or intensify thin, weak negatives, such as are plentiful enough in these days of "modern developers." Let us take a negative such as every hand-camera worker is familiar with. The image has sufficient detail, but lacks general density, and gives weak, flat prints. Our problem is to increase the general opacity and, if possible, add to the contrasts of the image. The ideal way would be to add new silver particles to those already forming the image. There are intensifying methods, as we will see, which are said to accomplish this desirable purpose, but they are seldom used, on account of difficulties in manipulation and the constant tendency of silver nitrate to stain the gelatine film. The methods most generally used are those in which the silver of the image is changed to some other compound offering greater resistance to the light by its greater opacity, and so effecting the purpose in view. Of these the mercurial methods are generally recognized as at once the most satisfactory and reliable, and these we will deal with first.

Mercurial Intensification. If we immerse a negative in a solution of mercuric chloride (corrosive sublimate, a *poison*) the image will gradually whiten until it is bleached through to the under side of the film. An examination of this bleached image shows a great increase of deposit. What has happened? The silver, by association with mercuric chloride, has been reduced to silver chloride, and associated with each atom of silver chloride we have mercurous chloride. The image is, however, less opaque than the original image, because of its whiteness. To produce the desired increase in opacity, it is necessary to change the color of the image. This can be effected by various reagents, and the use of these will now be considered.

With Ammonia. By flowing a dilute solution of ammonia over the bleached negative, the chloride of silver is dissolved, and we get a brown-black image of uncertain composition, probably mercurous ammonium chloride. This method is perhaps that most generally followed in Britain. It has been condemned by many, because of the reputed instability of its results, but it is convenient in manipulation, and gives a very dense image. The two chief points to be noted in its working are (1) to bleach the negative only as far as the amount of intensification requires, i. e., to stop the bleaching operation when the desired opacity is reached, and (2) to wash the negative very thoroughly before and after bleaching. It is held by some that ammonia does not intensify the weaker details in a negative, so that its use is indicated where it is especially desired to strengthen the contrasts in a negative.

FORMULÆ—*Bleaching Solution.*—The strength of this, within certain limits, does not seem to be of importance. Several workers advise a cold, saturated solution of mercuric chloride, to each ounce of which three drops of strong hydrochloric acid are added. Others advise a half-saturated solution of mercuric chloride alone, without the addition of acid. The extent and character of intensification can be controlled somewhat by the amount of bleaching permitted. For uniform intensification throughout the image, the latter must be completely bleached. If, however, it is desired to intensify the shadow details more than the high lights, as in portraiture, the plate should be removed from the mercury solution as soon as the shadows are bleached, and rapidly washed to stop the bleaching action on the more opaque high lights. This is a matter in which experience will inform the eye to judge as to the amount of opacity desired. After bleaching, the plate must be thoroughly washed, and preferably in soft water, as hard water tends to precipitate the mercury salt in the film, subsequently producing stain or fog. When washed, the image is blackened by immersing the plate in a *Blackening Solution*: stronger ammonia water (or ammonia .880), 1 ounce; water, 9 ounces. If a stronger solution than this be allowed to act on the bleached image for some little time, part of the intensification first resulting is undone, and the result is an increase in the contrasts of the negative, which may be useful for a special purpose.

Another formula, strongly recommended, runs as follows: I. Mercuric chloride, 1 dram; ammonium chloride, 1 dram; water, 4 ounces. II. Ammonia .880 (stronger ammonia water), 1 dram; water, 4 ounces. Bleach in I as desired, wash well, and blacken in II. Solution No. I may be used repeatedly.

With Ammonium Sulphide.

This is a variation of the method given above, and has no advantage except a slight gain in opacity. Bleach in: mercuric chloride, saturated solution, 5 ounces; common salt, ¼ ounce. Wash well, and blacken in: ammonium sulphide, 1 ounce; water, 10 ounces.

This solution has a powerful and unpleasant smell, hence it should be used near an open window.

It may be here mentioned that the stains which at times result from mercurial intensification can be removed, it is claimed, by washing the plate for a few minutes, and then immersing it in a 10 per cent solution of ammonium sulphide, but this is a doubtful remedy.

With Sodium Sulphite. If instead of blackening the bleached image with ammonia, we use sulphite of soda, the silver chloride is dissolved as before, and we get an image composed of black metallic mercury. As commonly used in America, an equal amount of potassium bromide is usually added to the bleaching solution, making it practically a mercuric bromide solution. The image so obtained is less intense than that given by ammonia, but an advantage of the method is that there is less necessity for prolonged washing between bleaching and blackening the plate. I give a typical formula. *Bleaching Solution:* Mercuric chloride, 1 ounce; potassium bromide, 1 ounce; water, 40 ounces. When the image is bleached, rinse the plate in water to thoroughly remove the mercury, and immerse it in the *Blackening Solution:* sulphite of soda, 1 ounce; water to make 10 ounces. When intensity is reached, wash the plate and dry as usual. If the sulphite fails to do its work, the cause is probably alkalinity of the solution. Add a few drops of citric or sulphuric acid.

An Alternative Method. Another method, with which I have had satisfaction, is that published some years ago by Chas. L. Mitchell and John Bartlett. I quote from their account:—The negative should, after fixation, be thoroughly washed and then dried. The dry negative is then placed in a suitable dish, film side up, covered with clean water, the face swabbed over thoroughly with a tuft of absorbent cotton to remove air-bubbles, allowed to soak for a few minutes, then the water poured off, and sufficient of the following solution poured on to cover the plate: citric acid, 60 grains; perchloride iron (dry), 60 grains; water, 16 ounces. This is kept in constant agitation over the plate for about a minute, then returned to its bottle, and the plate washed under running water for about five minutes. This solution can be used repeatedly for a long time before becoming exhausted. Its use is twofold: it tends to remove any thin film of fog upon the surface of the negative, and also furnishes a groundwork for the subsequent deposit of mercury. The plate is now bleached by being placed in the following solution: mercuric chloride, ½ ounce; common salt, ½ ounce; water, 16 ounces. The addition of the salt facilitates the solution of the mercuric chloride. The plate must be frequently rocked while in this solution, and allowed to remain in it until sufficiently bleached. This is regulated by the amount of intensification required. If considerable density is desired, it must be allowed to remain until quite white. This solution is then to be poured off, and can be either thrown away or used for several more plates; the best results are obtained, however, by using fresh solution for each negative. The plate is next covered with some of the following solution: common salt, 2 ounces; water, 32 ounces.

This is allowed to remain on the plate for about a minute, then poured off and thrown away, and the plate well washed under the tap for about five minutes. The object of the salt is simply to dissolve out any mercuric chloride remaining in the film, and prevent the clear portions of the negative becoming clogged up with any reduced mercury in the next operation. The plate is now returned to the dish, and a sufficient quantity of the reducing solution poured on it to just cover it. This is made as follows: sodium sulphite (cryst.), 3 ounces; sulphuric acid (conc.), 2 drs. or ¼ ounce, by weight; water, 16 ounces.

The sulphite is dissolved in 12 ounces of water, allowed to cool, and then the acid, previously mixed with 4 ounces of water, added. I should say just here to those not familiar with chemical manipulation, that in mixing sulphuric acid and water, the acid should always be poured gently and in small quantities into the water, not the water added to the acid, as in the latter case, owing to the violence and heat of the combination, some of the acid might be thrown in the face of the operator,

As soon as the reducing solution is poured on the plate it commences to turn brown and then black. The operation is completed when the *back* of the plate is perfectly dark, showing no traces anywhere of the whiteness caused by the mercury. The negative should then be perfectly bright and clear, and of a brilliant bluish black color. It is then to be placed under the tap, washed for five or ten minutes to free it from all traces of sulphite. swabbed off with a piece of cotton, and set up in a rack to drain and dry. The reducing solution can be used several times until it becomes exhausted, and is then thrown away. It should never be returned to the original stock bottle. This process can be depended upon to yield in every case good and satisfactory results, and the intensification produced is perfectly permanent in character. The main points to which attention must be directed in order to secure good results are these: (1) All solutions used must be filtered, clear, and free from specks. (2) The negative must have been previously *well washed*, so as to *thoroughly remove all traces of hypo*. (3) The negative must be moistened before the solutions are poured on, so that they will act evenly and uniformly on the plate.

A negative can, if necessary, be intensified immediately after development, fixation, and washing, without being allowed to dry, but in this case the density obtained will not be so great as if the plate had been previously dried.

With Ferrous Oxalate.

According to Chapman Jones, who in 1897 went into the question of mercurial intensification very thoroughly, the most reliable of these methods is that in which the bleached image is treated with a ferrous-oxalate developer. In this method the mercurous chloride is reduced to the metal as in the case of the sulphite of soda method, but the silver chloride is similarly reduced. The practical result is that the original silver image is increased by almost twice its weight of mercury. This means a great gain in opacity, and the process offers the great advantage that the intensified image may be bleached again and reintensified as often as we may desire in order to get the opacity required. The well-fixed and washed negative is bleached as usual with mercuric chloride (saturated solution), after which it should be well washed, and then soaked for a few minutes in distilled water, or water which has been well boiled and allowed to get cold. This last soaking is essential to get rid of any lime in the film, which will inevitably produce marble-like stains. The plate is blackened in a ferrous-oxalate solution made as follows: Pour 1 ounce of a saturated solution of ferrous sulphate into 5 ounces of a saturated solution of potassium oxalate slightly acidified with oxalic acid, and add 3 ounces of water. When darkened to the desired point, immerse the negative in two separate baths of distilled or cold, boiled water, and finally wash in the usual way.

Other Redevelopment Methods.

Another method, which has become popular of late, is to bleach the negative with mercuric chloride, wash thoroughly, and redevelop the image with any strong developer giving a black deposit, such as hydroquinone. Yellott, on page 84 of our last number, gave some suggestions concerning this method. Gmeiner advises the following procedure: Bleach the well-washed negative in: mercuric chloride, 1 dram;

potassium bromide, 1 dram; water, 25 drams, at least sufficient water to thoroughly dissolve the salts. After bleaching, wash the plate for fifteen minutes in running water, and darken in a solution made up in the subjoined proportions: Hydroquinone, ½ grain; sodium sulphite, 2 grains; potassium bromide, 1 grain; potassium carbonate, 1 grain; water to make 1 ounce. Pour this into a tray, and slide the negative quickly into it. When the bleached plate has somewhat darkened, pour off the solution into a graduate, and add an equal quantity of new developer to it, omitting the bromide. Take the plate from the tray, pour in the developer, immerse the negative, and rock the plate until density is acquired. When intensification is complete, the negative needs only to be washed and dried, after which the whole process may be repeated if the density is still insufficient.

Giving his experience with a somewhat similar method, George T. Harris says: The amount of bleaching I proportion to the degree of intensity required. It is usually stated that the bleaching should be thorough, and carried right through the film; this I have never found necessary except where the maximum density was required. Negatives which want a very slight increment of density receive only a momentary application of the bleaching solution, and seem equally permanent with those completely whitened. The washing after bleaching *must be thorough;* the success of the operation depends on it. Merely soaking for an hour or two in standing water is the way to court stains and disaster when redevelopment takes place. If the bleached negative cannot be washed in running water, at least the water should be frequently changed, and at each change the surface of the negative rubbed with a tuft of cotton-wool. After an hour's washing under running water the bleached negatives are placed in a bath of common salt 1 ounce, water 10 ounces, for several minutes, and it was the introduction of this bath that made mercurial intensification in my hands a reliable process. A fair amount of washing after the salt bath leaves the negative in a fit state for redevelopment. This, after trying several agents, I effect with metol, as more certain in its action and less liable to produce iridescent stains. The formula used is as follows: I. Metol, 46 grains; sodium sulphite (cryst.), 1 ounce; potassium bromide, 7 grains; water, 10 ounces. II. Sodium carbonate, 46 grains; water, 10 ounces. To make up the developer, take 3 ounces of I and 1 ounce of II, and apply until the bleached image is thoroughly reduced, when a fine black will result, very different in appearance from the brown image left after blackening with carbonate of sodium. If the density should be considered excessive, it may be reduced, as will be seen later, by a weak solution of ferricyanide and hypo; with practice a discrimination in bleaching will be attained that renders unnecessary any such operation. Very slight washing suffices to remove the developer, but it is desirable to pass the negatives through a weak hydrochloric acid bath, as the carbonate of soda often precipitates the lime suspended in the water, and causes a white powdery film to appear on the negative when dry.

No length of immersion in hyposulphite will reduce a negative thus intensified, which fact has always appeared to me a testimony to its permanence. If the negative should be over-intensified, the only means of reducing it is by the application of a weak solution of Howard Farmer's reducer, given on another page.

With Gallic Acid, etc. This method, due to Dr. Vansant, is said to yield fine negatives when carefully handled, special stress being laid on the proportions given in the formula. It consists in blackening the bleached image, after very thorough washing, in a freshly prepared solution, as follows: Distilled water, 4 fluidounces; gallic acid, ⅛ grain; caustic potash (KOH) pure, 2 grains. Gently rock the tray during the blackening, which will not occupy more than a few minutes. Prolonged immersion will stain the film and cause it to frill. After intensification, wash the negative thoroughly and dry as rapidly as possible.

Mercuric Iodide with Sulphite. The old one-solution intensifier containing mercuric iodide and hyposulphite of soda, responsible for many troubles, has recently been improved out of existence by a modification introduced by the Lumière Bros. This consists of substituting sodium sulphite for the hyposulphite in the usual solution of mercuric iodide. It is claimed that with this modification the intensified negatives do not turn yellow or change in any way. Messrs. Lumière further say: This advantage in the use of anhydrous sulphite of soda over hyposulphite springs from the fact that an excess of anhydrous sulphite can be used without disadvantage, while intensification ceases in the presence of an excess of hyposulphite. After determining the cause of alteration and staining of the image, we have arrived at completely avoiding this after-effect, by treating the negative, after intensification, with a developer, which, without changing either the color or intensity of the image, prevents all the subsequent yellowness, and assures its preservation with the initial color and intensity. Intensification with mercuric iodide, practised under the conditions which we indicate below, solves, therefore, completely the problem of direct intensification.

This intensifier presents the following qualities: 1. It enables intensification to be effected by the use of a single solution, and the action to be followed closely on the plate, which is impracticable with the ordinary perchloride of mercury intensifier. 2. The intensification may take place when the plate leaves the fixing bath, after slight washing, without fear of the yellowing of the film, which would infallibly occur with perchloride of mercury if all trace of hypo were not carefully eliminated. 3. Finally, the bath can be rapidly prepared, its components being very easily soluble. Formula for a normal intensifier: Water, 100 parts; anhydrous sulphite of soda, 10 parts; mercuric iodide, 1 part.

The instructions for the use of this new intensifier are: Dissolve the anhydrous sulphite of soda in the water, then add the mercuric iodide. The solution is almost immediately ready. When it is wished to intensify the plate immediately after fixing, it should be briefly washed and then placed in the intensifying solution. If the intensification is to take place on a negative already dry, it is useless to wet it before plunging it in the intensifier. The action is rapid and very regular, and the gradual intensification can be easily followed by examining it against the light, without fear of stains or discoloration as with perchloride of mercury. The rapid action of the intensifier can be restrained at will without changing the final result by the addition of water. On the other hand, the energy of the intensifier can be increased by adding a larger quantity of mercuric iodide, together with anhydrous sulphite of soda, but without exceeding the maximum quantities of 2 parts of mercuric iodide to 20 parts of anhydrous sulphite of soda. On leaving the intensifying bath, the plate is briefly washed in running water, then plunged for some minutes in one of the following developers, prepared as for an ordinary development: rodinal, hydramine, pyrogallic acid, hydroquinone, etc. Under these conditions, without altering the intensity of the negative to any appreciable degree, the after-effects mentioned above are avoided. The operation is finished by washing the plate in running water in the ordinary way. This intensifier is obtainable commercially in a convenient form.

With Potassio-Cyanide of Silver. This is a mercurial method recommended by Carbutt as "very effective and the most permanent of methods." Prepare solutions as follows: I. Mercuric chloride, 120 grains; ammonium chloride, 120 grains; distilled water, 10 ounces. II. Ammonium chloride, 120 grains; water, 10 ounces. III. Distilled water, 6 ounces; cyanide of potassium (*poison*), 60 grains; distilled water, 2 ounces; nitrate of silver, 60 grains. Make up III in two parts, as indicated, and pour the silver into the cyanide solution, with constant stirring. Mark the bottle plainly with the word *Poison*.

Wash the plate to be intensified at least half an hour. Then immerse it in a 5 per cent solution of alum (23 grains to the ounce), and again wash thoroughly to insure the complete elimination of all hypo from the film. The least trace of yellowness in the film after intensifying will show that the washing was insufficient.

To intensify, flow sufficient of No. I over the plate to well cover it and allow the negative to whiten more or less completely, according to the effect desired. The longer this action continues, the greater will be the final intensity of the image. Now pour off the bleaching solution, rinse the plate and flow it with solution No. II, allowing this to act one minute only. Pour off and wash the plate, then flow with or immerse in No. III until blackening is completed. Wash thoroughly and dry. Solutions Nos. I and II should be thrown away. No. III may be used again. A negative made over-dense in this way can be reduced by immersing it in a weak fixing bath, but the operation should be carefully watched, and the negative washed with plenty of water as soon as the reduction has sufficiently acted on the image.

A somewhat simpler formula is that advised by F. Edwards. Prepare the following solutions: I. Mercuric chloride, 50 grains; water, 5 ounces. II. Potassium bromide, 50 grains; water, 5 ounces. Mix these two solutions after preparation and label the combination *Bleaching Solution*. Prepare III. Nitrate of silver, 50 grains; cyanide of potassium (pure), 50 grains; water, 5 ounces. Bleach the well-fixed and washed negative in the combined solution, and after a thorough washing darken to the desired intensity by immersion in III, after which the negative must again be washed.

AGFA. Although a patented preparation, the AGFA one-solution intensifier recently introduced possesses sufficient general interest to be mentioned here. It is based on the use of double salts of sulpho-cyanide of mercury and an alkali metal, and comes in the form of a concentrated solution, 1 part of which is diluted with 9 times its bulk of water for use. Negatives, duly fixed and washed, are immersed in this dilute solution, and gradually darken with a greyish black deposit of greater intensity than that given by the mercuric bromide and sulphite method. The action is somewhat slow, which is advantageous. When the desired density is gained, the plate is washed for ten or fifteen minutes, and dried. The advantages of the single solution, without necessity of using the preliminary bleaching solution, will be obvious.

Mercury with Platinum. The single-solution platinum intensifier, introduced by Willis & Clements (The Platinotype Co.), is one of the most satisfactory of commercial intensifiers. In my experience it has, perhaps, given better results with pyro-developed negatives than with those developed with more recent agents, such as eikonogen, amidol, etc. I have not been able to find a reliable formula for the preparation of a platinum intensifier, but that under notice is probably composed of mercuric chloride and a platinum salt. Its action, when used according to the instructions accompanying it, is somewhat slow and easily controllable.

A Silver Intensifier. The methods of intensifying negatives with silver are not recommended by the best authorities, nor have they obtained much popularity. I give two methods here for the possible advantages they offer. The first is the method introduced by J. B. B. Wellington, which is said to give an image of silver and to build up a satisfactory negative from the faintest ghost of an original negative. In this method there is no necessity for totally removing hypo from the negative to be intensified. It may be taken from the fixing bath and rinsed for a couple of minutes under the tap, after which it is ready for intensification. First prepare the following solutions: *Stock Solution*—Silver nitrate, 100 grains; distilled water, 2 ounces. When dissolved, add ammonium sulphocyanide, 240 grains. This will form a precipitate, which will gradually dissolve. The solution should now be diluted with 10 ounces of distilled water, which will again cause a precipitate to be thrown down. To this solution add sufficient of a saturated solution of hypo to dissolve the precipitate. To intensify, take 1 ounce of this *stock solution* and add: pyro, 3 grains; sodium sulphite, 12 grains; strongest ammonia (.880), 6 minims; ammonium bromide, 2 grains. Immerse the negative in this, and rock the tray until the desired density is obtained. This should be accomplished in from five to ten minutes, after which the negative should be well washed.

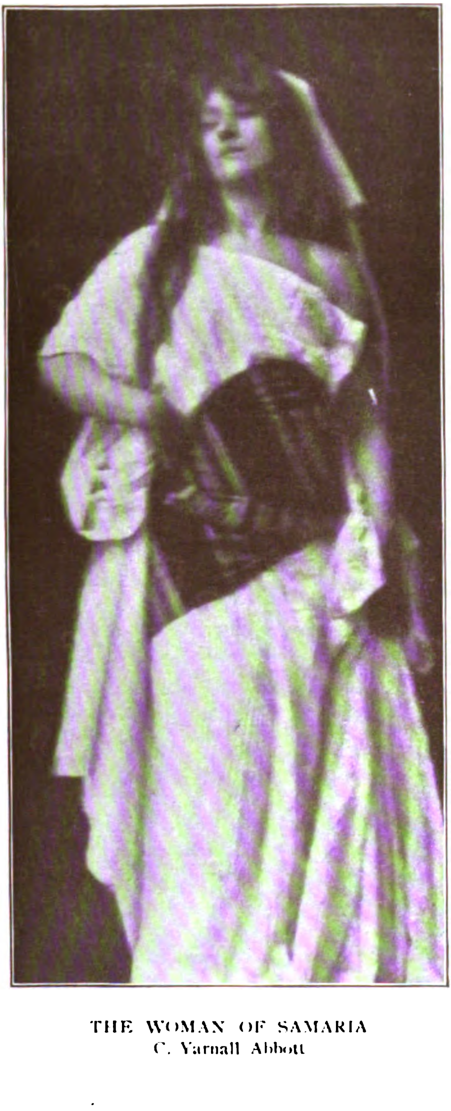
An alternative method was suggested by Balagny some months ago, as follows: Prepare two solutions. I. Nitrate of silver, 65 grains; distilled water, 3 ounces. II. Sulphite of soda, 350 grains; distilled water, 3 ounces. Add II to I gradually. At first a whitish precipitate will be formed, which, however, will dissolve on further addition of II. The negative to be intensified is immersed in this solution until bleached through the film, after which it is thoroughly washed, and developed with an ordinary hydroquinone or pyro-soda developer.

With Copper. A copper intensifier, which is "made in Germany" and is recommended for flat negatives lacking contrast, is made up and used as follows: I. Sulphate of copper, 196 grains; hot water, 1 ounce. II. Potassium bromide, 196 grains; water, 1 ounce. Mix I and II; allow to cool, and pour off the green solution from the crystalline deposit. Bleach the negative in this liquid, wash for a short time, and blacken in a 10 per cent solution of silver nitrate. The image so produced can be strengthened still further by developing it with an ordinary developer if its density is insufficient. Over-intensification can be corrected by immersing the negative in a dilute bath of potassium cyanide, 2 grains; water, 1 ounce.

Ferricyanide and Uranium. With many workers who do not care for the use of mercurial methods, the ferricyanide and uranium method is found to give equally good results. Negatives intensified in this way have a red color, which is deceptive as far as printing opacity is concerned, and considerable judgment is required to avoid over-intensification. Dr. Eder advises the subjoined formulæ: I. Uranium nitrate, 15 grains; water, 4 ounces. II. Ferricyanide of potassium, 15 grains; water, 4 ounces. Distilled water should, if possible, be used in the preparation of these solutions. For use, take 1½ ounces each of No. I and No. II, mix, and add ½ ounce of glacial acetic acid. The well-washed negative is immersed in this, with occasional rocking of the tray until the desired intensity is secured. After intensification, the plate should be washed for ten or fifteen minutes. Prolonged washing will remove the intensification, and marking or streaks will follow if the water is permitted to fall on the plate with force. If the washing is continued until the greasiness of the surface of the film, resulting from the use of the acid, is removed, this will be sufficient. Over-intensification can be reduced by immersing the negative in a weak solution of ammonium carbonate or ammonia water, which discharges the color from the image. Advantage may be taken of this to use the method as a means of local intensification. Thus, the negative is first intensified completely, and the image reduced locally by applying a dilute ammonia solution (½ ounce ammonia water in 15 ounces of water) with a camel's-hair brush. In doing this the negative should be held so that the ammonia solution does not run over the spot being reduced, and the plate should be frequently immersed in a tray of water.

With Lead. Intensification with lead is not in favor for negatives other than those intended for black and white reproduction where excessive contrasts are desired. It gives the maximum effect possible by any method of intensification, and hence tends to quickly block the half-tones where these are present in the negative. Herr Hirschfeldt, in the *Photographen-Zeitung*, strongly recommends the lead intensifier, on the ground that it gives an almost unlimited intensification, absolute clearness if there is not any fog already in the negative, a very fine grain, and with absolute permanency if a sulphide is used to blacken the film. The solution he uses is as follows: Lead nitrate, ½ ounce; potassium ferricyanide, ¼ ounce; distilled water, 13 ounces. In this the negative is bleached and then blackened with an old and used hydroquinone developer. The bleached negative must be well washed prior to blackening, and the bleaching should not be carried too far, as this method gives very great intensification. When placed in the developer, the negative, which is more or less yellow from the lead bath, turns white and then dark brown. If the intensification is not sufficient, the operation may be repeated. If it is required to clear the negative before intensification, it should be left in the lead bath till bleached quite through, then thoroughly washed and placed in a 10 per cent solution of sodium sulphite till sufficiently reduced, then darken by the developer.

Chapman Jones recommends: Lead nitrate, 20 grains; ferricyanide of potassium, 30 grains; distilled water, 1 ounce. This should be filtered. Bleach the negative in this solution and, after thorough washing, blacken with ammonium sulphide, 1 ounce; water, 10 ounces. The washing between bleaching and blackening must be continued until the drainings from the negative have a scarcely perceptible blue color when a few



THE WOMAN OF SAMARIA
C. Yarnall Abbott

BUFFALOES
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drops of a 10 per cent solution of ferrous sulphate are mixed with them in a graduate. The least trace of lead remaining in the film will result in fog and stain.

Ammonium Persulphate Intensifier. Namais has recently advanced the claim that a solution of ammonium persulphate saturated with silver, in the presence of pyrogallol, will act as an intensifier. The amount of intensification obtained by practical test of the method is not as great as that given by some of the mercurial methods, and the process is, as yet, too imperfect to permit of practical details being included here. It seems, likely, however, that this salt will play a useful part in a single-solution intensifier to be employed where a moderate degree of intensification is required.

Comparisons. We have now glanced over the principal methods available for the intensification of negatives, and the reader will naturally inquire as to their comparative value for different classes of work. This is by no means easy to decide (1) because the effect of the same intensifier differs according to the developer originally employed in the development of the plate. Theoretically, this should not be possible, as we are supposed to obtain in development an image of metallic silver; but in practice it will be found that a pyro-developed image and an eikonogen-developed image will show distinct differences in opacity and color when intensified with the same intensifier under identical conditions; (2) because very slight variations in manipulation result in variations of effect. And there are other causes which operate in practical work to prevent one from giving an exact statement of the differences between results given by this or that method and another. The attempts thus far made to compare these differences, even by computing the deposit given by an intensifier under certain conditions, convey little definite information and can only be regarded as suggestive. Taking the published comparisons, we may conclude that:

1. Mercuric chloride, followed by sulphite of soda, gives a very slight addition of density, with probable reduction in the shadows, due to the solvent action of sodium sulphite on silver chloride.

2. Mercuric bromide (mercuric chloride and potassium bromide), followed by sodium sulphite, gives a decided gain in density over No. 1, with an amount of contrast due to slight reduction in the shadows. This method is recommended for portraiture and general use, where violent intensification is to be avoided.

3. Mercuric chloride, followed by ferrous oxalate, gives density equal to that produced by No. 2; perhaps a little more, and has the advantage that it may be repeated.

4. Method No. 3, when repeated, carries the density gained a step further, and is suited to negatives requiring vigor.

5. Mercuric chloride, followed by ammonia, gives practically the effect gained by method No. 4, but is less reliable in manipulation.

6. Mercuric chloride, followed by redevelopment with alkaline developers, will give any desired degree of intensity within moderate limits, and may be advised for landscapes, street views and similar work where general addition of printing density is desired.

7. Mercuric iodide, followed by redevelopment with pyro-soda or hydroquinone, gives decided increase in density, especially in the high lights, and is useful for increasing the contrasts in a flat, weak negative.

8. AGFA and the platinum intensifiers, although not giving as decided an increase in density as the mercuric iodide method, give a relatively greater intensification in the half-tones. These are, therefore, indicated as energetic intensifiers for portraits or landscapes requiring vigor, as for printing on platinum paper, etc. Dr. Eder regards AGFA as a distinct improvement on existing methods of intensification.

9. Uranium methods give great increase of density, being more energetic in their action than the mercurial methods. For this reason they are not advised save when an image of unusual opacity is required. The third or fourth repetition of the mercuric chloride and ferrous oxalate method will produce the same result.

10. Lead intensifiers produce the maximum amount of density, and are not suitable for general purposes.

11. Where the image is exceedingly weak, with ghost-like details, the uranium or silver intensifier is indicated as possessing the energy required to build up a vigorous image from a slight foundation.

These notes, however, are only intended as rough guides to the characteristics of the various methods. The choice of the right intensifier for a special instance must, necessarily, be guided by the worker's experience and individual needs.

Local Treatment. It is passing strange to note how meagre are the references to local intensification of negatives in photographic literature. The subject is rarely mentioned. Possibly this reticence arises from the hard fact that local treatment in intensifying a negative is a difficult detail to manage successfully. In my personal experience I have had many failures, and few successes that were really satisfactory. These failures have arisen chiefly from the difficulties presented by the nature of the gelatine film of the negative. If we work upon it locally with a brush, in a dry state, harsh lines are apt to show where the intensifier is applied. To control these outlines with gum water, or to soften the outlines by using glycerine or other "thickeners" to give "body" to the intensifier, sounds well in theory, but rarely works satisfactorily in practice. In the few cases where I have used these "thickeners" successfully, the negatives were first soaked in water to give an equally wet film, then allowed to become surface-dry, and the local treatment applied in the form of a mixture of AGFA or platinum intensifier and glycerine, by means of a soft brush. But the intensifier spreads, and the result has been the ruin of many negatives.

In the intensification of foregrounds of views, or other large masses, I have had reasonable success with the mercuric chloride and ammonia method. First bleach the portion of the dry negative which it is desired to intensify, using care to keep well within the boundaries of the space to be treated. When the bleaching has proceeded as far as seems desirable coat the unbleached portion of the plate with a solution of rubber, 2 grains; benzole, 1 ounce; wash the whole negative well, as usual, and finally spray the bleached portion with ammonia solution by means of an atomizer. The thin film of rubber protecting the portions not intensified can be removed from the negative by gentle rubbing with the finger tip. Extreme carefulness is required, of course, at every stage of the work, and the experiment should be first attempted on several useless negatives.

Pfabe's intensifier, a single solution intensifier obtainable commercially, has perhaps given me the most satisfactory results in local intensification. It is applied to the dry film with a small brush, and success depends largely on carefulness in manipulation.

A more satisfactory way is to intensify the whole negative with uranium, and then reduce it locally, as suggested when we dealt with the use of uranium as an intensifier. As a variation of the method there given, the following, quoted from *Photography*, may be useful:

A formula often recommended, and one we have employed with success, is the uranium intensifier. For this purpose the negative must be thoroughly well washed, and if it has not been allowed to dry between developing it and the application of the intensifier, so much the better. The negative is first intensified all over by being immersed in a mixture made by taking equal parts of the following three solutions: A—Uranium nitrate, 10 grains; water, 2 ounces. B—Potassium ferricyanide, 10 grains; water, 2 ounces. C—Glacial acetic acid, 1 dram; water, 2 ounces.

Those who are accustomed to uranium intensification may be cautioned that for the purpose of local work it should be carried a little farther than if the intensification is to be general, because it is well to wash the negative thoroughly afterwards, and this always removes some, if not all, of the extra vigor imparted. As soon as the plate is intensified it is rinsed under the tap for two or three minutes, and stood up to drain, removing any drops with the corner of a clean handkerchief. It must not be allowed to dry, but merely must be made "surface-dry." The parts which it is not desired to intensify are then very carefully brushed with a 5 per cent solution of strong ammonia (strong ammonia, 1 ounce; water, 19 ounces), using a fine camel-hair pencil. The intensification will be seen gradually to disappear in those parts reached by the ammonia. When finished the negative is again washed under the tap.

By means of this final washing the degree of intensification can be very easily controlled, as the density given by the uranium gradually washes away, and this action can be stopped at any point that is thought to be desirable. It is a good plan to intensify well, and to wash away to some extent, as this helps to soften down the lines of junction between the parts intensified and those where the ammonia has acted. The color is a deceptive one, especially on negatives of a black or blue-black character, to which uranium gives far more density than would at first sight be supposed.

Reduction Methods.

The natural man, after worrying through a season with thin, under-developed negatives and methods of intensification, resolves to spend more time over the development of his exposures in future. Here again, however, the personal factor comes in, and overmuch resolution produces a crop of over-dense negatives—the result of development allowed to run too long, or of over-exposure on which an energetic developer has worked lovingly and well.

When we have negatives with these faults—overmuch density, too much opacity all over, or excessive contrasts, —the remedy lies in general or local reduction of this opacity. By reduction the surplus density is removed, the contrasts rendered more harmonious, and details hidden beneath the cloud of opacity are revealed. Until recently, the methods by which a too dense negative might be reduced, and its printing quality thereby enhanced, were few in number and tedious in manipulation. Latterly new methods and reagents have been introduced, and we are fairly happily situated as far as this detail of photographic work is concerned. In our consideration of reduction methods, however, we will deal first with the older methods, so that the advantages of the later processes may be more readily apparent.

Farmer's Reducer. The favorite method of reduction is that introduced by Howard Farmer some years ago, and generally known by his name. It is a solution of hypo-soda mixed with a small quantity of potassium ferricyanide or *red* prussiate of potash. As daylight decomposes a solution of ferricyanide very quickly, the work of reduction should not be carried on in a strong light and, if kept in solution, the ferricyanide should be protected from the light.

The procedure is as follows; Dissolve 1 ounce of ferricyanide of potassium in 9 ounces of water and make the solution up to 10 ounces, forming a 10 per cent solution. The negative to be reduced should be immersed in water for an hour or so to ensure its being thoroughly and uniformly wetted. Now take enough fresh hypo fixing bath for the purpose and add to it enough of the ferricyanide solution to make it a light straw color. The negative to be reduced is immersed in this solution, when it will be seen to lose density. The tray should be rocked to ensure uniform action of the reducer, and the negative should be frequently examined, by looking through, to watch for the point of sufficient reduction. The rapidity of the reduction depends upon the quantity of ferricyanide added to the hypo solution. The plate should preferably be removed from the solution before the reduction is as full as was intended, and immediately well washed in plenty of water. If the solution should seem exhausted, or refuse to continue the reduction, the addition of a little more ferricyanide will facilitate matters.

This method of reduction lends itself admirably to local treatment, such as the reduction of high lights or other peculiarly dense portions of the negative. This property makes it useful for negatives which have been under-exposed and developed with harsh contrasts. A small quantity of the hypo and ferricyanide solution is put into a graduate or cup; the plate to be locally reduced is immersed in a plain hypo bath (1 to 4) for a few minutes, and then lifted until the over-dense portion is above the solution. The mixture of hypo and ferricyanide is now applied with a small brush where reduction is needed, and after a moment or two the plate is slid back into the hypo solution. This procedure may be repeated as often as is necessary, so long as the reducer is not too strong in ferricyanide and the plate is not kept out of the hypo solution for too long a time.

Ferric-chloride Method.

Another efficient reducer is ferric-chloride, 1 dram; hydrochloric acid, 2 drams; water to make 10 ounces. The negative to be reduced is well washed after fixing, and immersed in the above for a minute or so. On taking the negative out from this solution, no action will be apparent, but on transferring it to a freshly mixed hypo bath reduction will take place very quickly, and the operation should be carefully watched, being stopped a little short of completion.

Belitzski's Reducer.

This is an old favorite among photographers, has the advantage that it does not yellow the film as Farmer's Reducer will sometimes do, and leaves the color of the image unaltered. The original formula, as published by Belitzski, contained potassic ferric oxalate — which is not always easily obtainable. In making known an amended formula Jarecki says: I prepare this as needed, from the "solution of chloride of iron" used in medicine, easily and cheaply obtainable at any druggists'. It is also known as "Liquor ferri chloride," and is a solution of ferric-chloride (perchloride of iron), prepared according to fixed standards of strength, and little liable to variation on this account. It contains 37.8 per cent of dry ferric chloride. In using this salt, as below, there naturally is a by-product of potassium chloride, which does not in any way interfere with the action of the reducer. A working formula is as follows: water, 7 fluid ounces; solution of chloride of iron, 2 fluid drachms; potassium oxalate, 3 drachms; sodium sulphite (crystal), 2 drachms; oxalic acid (about), 35 grains; sodium hyposulphite, 1¾ ounces avoirdupois.

The solids are powdered (not necessarily the hypo), and the chemicals are added in the above order, dissolving one before adding the next. The color-reactions that take place are an amber color when the iron solution is mixed with the water; an emerald green on adding the neutral oxalate of potassium; a ruby red with the sulphite of soda; and the original green restored on dissolving the oxalic acid; in fact, the oxalic acid is added little by little until this green color appears, and, at the same time, the smell of sulphurous acid is perceptible. The color remains the same after the addition of the hypo. It is desirable to filter finally.

The advantages of this reducer are that the solution is permanent, it is always ready, and can be used over and over again for a long time, keeping it in the dark.

When the acid fixing bath is used, the negative can be transferred directly into the reducing solution without washing. It can be used for local reductions, and is equally good for negatives, lantern slides and prints. When not in use it should be kept protected from light.

Ammonium Persulphate.

Both Farmer's and Belitzski's reducers, although of great service, have the disadvantage that they reduce the negative equally all over. Hence the details of shadows are often lost in reducing over dense high lights. What is generally required is a reduction of the high lights, with the shadow details preserved. This selective action can be secured by the use of persulphate of ammonium, a new reducer introduced by Lumière almost two years ago, but just beginning to become known in this country. In practice a 2 or 3 per cent solution of the salt is usually made, and the well-washed negative immersed in this slowly loses density. When the desired amount of surplus density has been removed, the negative is at once immersed in a 10 per cent solution of sulphite of soda, which arrests the action of the persulphate. A short washing in water completes the operation.

This new reducer possesses so many advantages, and there is so much misunderstanding concerning its nature and use, that I make room for a clear explanation of its properties by Dr. H. Scott-Lauder:

Persulphate of ammonia is a white crystalline salt, somewhat deliquescent, and represented by the chemical symbols NH_4SO_4. It has the peculiar advantage of dissolving away the denser masses of metallic silver in apparently much greater proportion than it removes the thinner and more superficial layers which form the half-tones and faint details in the shadows, and is a very necessary addition to the laboratory. More especially, perhaps, is it useful to the inexperienced amateur, whose negatives so frequently partake of the soot-and-whitewash-giving variety. It is in this class of negative, under-exposed and over-developed, that the characteristic action of the persulphate is found most beneficial, as by it the over-dense high lights can be thinned down to any extent required, while the half-tones and shadow detail are acted on to a comparatively slight extent, so that harsh contrasts are greatly modified, just the reverse of what would take place when using the ordinary ferricyanide of potassium and hypo reducer (Howard Farmer's), with which the half-tones and faint superficial details would be cleared off before the high lights were much altered.

Now as to the practical application of the reducer. If the negative has been dried, it should be soaked in water for at least half an hour to soften the film.

I find that the most workable strength for the solution in which the negative is to be immersed is about 3 per cent, say 15 grains to each ounce of water. It dissolves easily, and, as it appears to be unstable in solution, it should be freshly dissolved shortly before use.

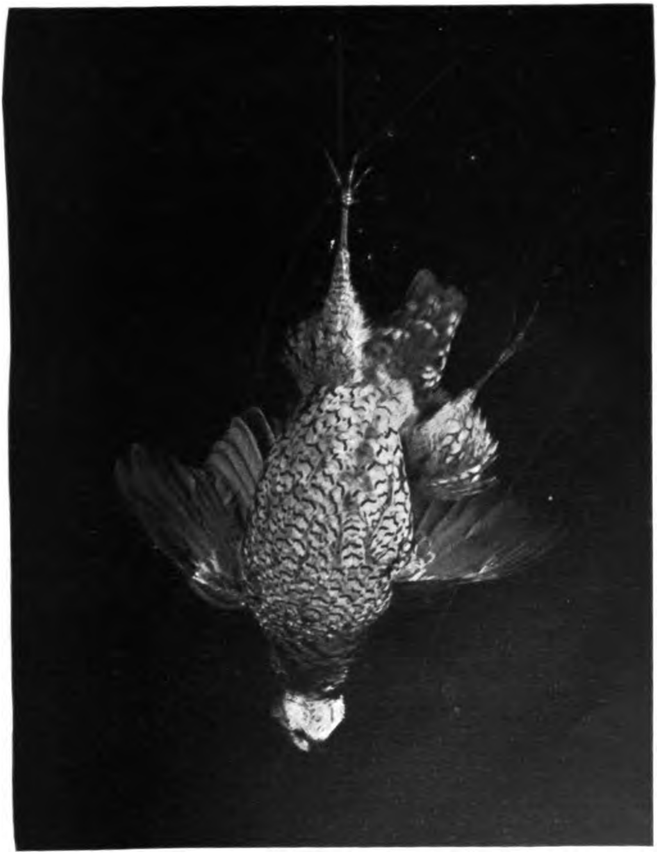
When the desired effect is produced, the action can be stopped at once by immersing the negative for a minute or two, after a slight wash under the tap, in a 10 per cent solution of sulphite of soda. The plate should then be well washed and dried. The silver image acquires a slight pinkish hue, which becomes deeper if left too long in the sulphite of soda solution.

It is clear that persulphate of ammonia has put a new power into the hands of photographers. The golden rule, to expose for the shadows and let the high lights take care of themselves, can now be carried out to the utmost limit without misgiving.

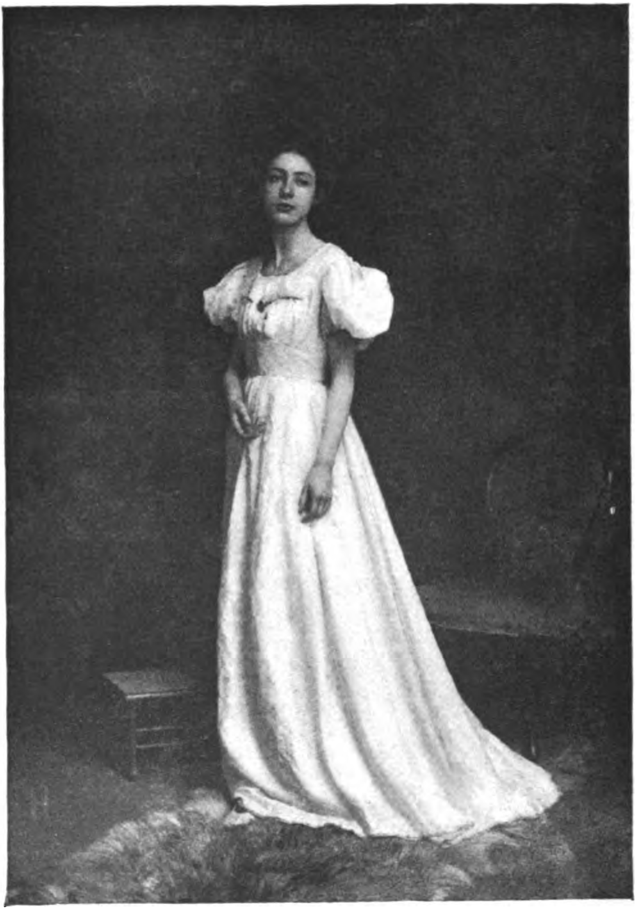
A whitewashed cottage in full sunlight, framed in dense foliage, need not be passed by, development may be pushed to any extent to secure detail in an under-exposed foreground, and printable clouds can be recovered from the densest sky.

In portraiture, likewise, the modeling of features lost in density can be reclaimed, and the folds of a white dress will reappear. Old negatives, put aside as hopelessly hard, will now again see the light, and will be transformed by this wonder-working reducer into satisfactory printers.

Cerium Reducer. Still more recently, Messrs. Lumière have investigated the reducing properties possessed by the per-salts of cerium, the result being the introduction of a concentrated solution of ceric sulphate with sulphuric acid which forms a very convenient negative reducer, similar to ammonium persulphate in its action. The cerium reducer being as yet unknown on this side of the Atlantic, I am indebted for the following account of it to the editor of *Photography*. Cerium sulphate, $Ce(SO_4)_2$



QUAIL
W. J. Cassard



MISS H.

Alfred Holden

Philadelphia Salon, 1899. American Institute, N. Y., 1899

$+ 4H_2O$, is the sulphate of the peroxide of cerium, a comparatively little known metal which chemists place in a group with didymium, lanthanum, erbium, and yttrium, all elements seldom heard of and usually described as "rare."

The salt is an orange-colored, dampish-looking crystalline mass, dissolving without much trouble in water, and giving a pale reddish yellow but clear solution. The strength MM. Lumière and Seyewetz advise for reducing purposes, 10 per cent, seems to be about the maximum that can be dissolved in the ordinary way. Moreover, heat does not appear to facilitate solution or to increase the quantity dissolved.

The reducing solution we prepared by dissolving 1 ounce of cerium sulphate in 10 ounces of water to which 200 minims of strong sulphuric acid had been added.

Such a liquid applied to a plate containing a very vigorous image indeed removed the whole of it in ten minutes, in spite of the fact that the plate had been finished, dried, and put away for some months. Applied to a plate which had been fixed and washed but not dried, the action was so powerful that a weaker reducer seemed desirable, and the 5 per cent strength was tried. This is more under control, and is what we should be inclined to recommend for ordinary work.

Although the liquid is of a yellow color, we could not detect the slightest staining of the gelatine, and the color of the image was unaltered. This applies, moreover, to bromide prints, and the fact that we have here a reducer which can be applied locally to a bromide print to remove some of the silver without altering the color of the remainder is a very distinct point in its favor.

Although it is too soon to pronounce definitely upon the future of this, the latest addition to the armory of the photographer, there seems every prospect that it will be of extensive use. It is simple in its composition, very energetic, and yet well under control; it keeps in solution all ready for use quite indefinitely, can be used over and over again until exhausted, and is not expensive in actual practice.

Permanganate Reducer. Another comparatively new reducer, little known among American workers, but deserving of greater popularity, is the permanganate reducer suggested by Namias some twelve months ago. To prepare the reducer, make up a 5 per cent solution of potassium permanganate—practically a cold saturated solution. Of this take 2 drams, dilute with water to make 6 ounces of solution, and add 30 minims of 10 per cent sulphuric acid. Each ounce of the reducer will thus contain 1 grain of permanganate and ¼ minim strong sulphuric acid. In this solution the negative will be reduced with fair rapidity, the action being more easily controllable if the negative has been dried before being immersed in the solution. If a brown discoloration forms on the negative during reduction, this can be removed by bathing in a 1 per cent solution of oxalic acid. After reduction, wash the plate as usual.

Copper Reducer. A simple and efficient reducer, advised by Shoemaker, is made up as follows: Sulphate of copper, 100 grains; bromide of potassium, 60 grains; water, 4 ounces. To use: immerse the plate in water and lightly rub the film until all signs of greasiness are removed. Pour a sufficient quantity of the copper solution into a tray and immerse the negative, examining it frequently to note the progress of reduction. For slight general reduction, a brief immersion in the solution will suffice. After the plate is sufficiently reduced, wash well and place in an ordinary hypo fixing bath until the color is removed. Local reduction is easily managed by applying the reducer locally with a wad of cotton, rubbing the portion to be reduced with a gentle circular motion, after which again immerse the plate in the fixing solution for a few minutes, and wash as usual.

Local Reduction by Friction. The method of reducing density in any portion of a negative by rubbing the too opaque part with a small wad of cotton moistened with alcohol is so well known that it needs only to be mentioned. Care should be taken to keep the cotton fairly moist, and that the rubbing be not too drastic on any one spot, or the film will suffer.

BOOKS.

The following books will be found useful as supplementing the methods above given:

The Perfect Negative. F. C. Lambert (Eng.). 1900. 50 cents.

Practical Reference Book. Part II. F. Dundas Todd. 1899. 50 cents.

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NOTES.

At last we seem to be "pulling up to time" in a satisfactory way! The July number of THE PHOTO-MINIATURE, dealing with *Bromide Printing and Enlarging*, will be published before the end of the month, and the August number will be ready during August. The "Bromide" number will present the usefulness of bromide paper (the ordinary paper as distinguished from the later varieties, such as *Velox*, *Cyko*, etc.) in a very interesting way, and will give the practical experience of an expert in its manipulation. The use of ordinary bromide paper is much more general abroad than in America, but its peculiar advantages will win the favor of American workers as quickly as they are understood.

The success which has marked the progress of THE PHOTO-MINIATURE since its first appearance steadily increases, and we gain new supporters as rapidly as the magazine is made known. The reprints of Nos. 1, 2, 3, 4, 6 and 7 are still in demand, and we are going to press immediately with new editions of Nos. 8 and 11. Much to our surprise and gratification a second edition of No. 5: *Stereoscopic Photography*, will soon be required. This would seem to indicate that stereoscopic photography is by no means as unpopular as is commonly supposed among amateur photographers.

We take this opportunity to again ask readers who are interested in the magazine to *mention* THE PHOTO-MINIATURE in all their dealings with our advertisers. This will not only be a decided help to the magazine, but will also secure more careful attention to their requests or orders.

There is an absurd craze among photographic advertisers at present, following which they judge the value of a magazine by the *number of replies* they receive from their advertisements in its pages. The point of view is, of course, a mistaken one and sadly lacking in intelligence; but, as long as it is persisted in, our readers can assist us by taking care that the advertiser to whom they write shall hear of THE PHOTO-MINIATURE.

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Despite the fact that a good view-finder is half the battle in hand-camera work, the finder supplied with the average hand-camera is something about which it is difficult to speak without an inclination to profanity. We are glad, therefore, to call attention to the *Seemore Finder*, announced on another page by Mr. Chas. H. Loeber. The *Seemore* has so many advantages over the ordinary view-finder that it must be seen to be appreciated, and Mr. Loeber offers to supply it, by mail, on the basis of "your money back if not satisfied." Get a *Seemore*, and be happy.

❧

Camera Craft is an attractive photographic monthly lately established on the Pacific coast. The issue last received, No. 3, contains a valuable article on "How to Test and Select a High-Grade Lens" by Ernst Gundlach, with other interesting features and illustrations. The journal is one of which our western co-workers may be justly proud, and deserves success. *Camera Craft* Publishing Co., San Francisco., Calif. 15 cents per copy.

❧

We have recently had an opportunity of giving practical test to the *Celeritas* developing powders announced by the Standard Chemical Co., Philadelphia, and find them an excellent article. The combination of metol and hydrokinone is one which has long commended itself as making a peculiarly efficient developer for plates or papers, and the *Celeritas* mixture gives evidence of careful preparation. Our tests were made with street views in which the shadows were perhaps a little under-timed, but by the help of *Celeritas* we managed to get satisfactory detail and harmonious contrasts.

❧

Replying to a correspondent, we may say that the most complete list of current photographic competitions readily accessible is that given in each issue of our contemporary, *The Photographic Times*, of New York. From the record given in the July number, it appears that over $1,500 in cash is at present offered for photographs in various competitions.

❧

The J. C. Millen Manufacturing Co., Denver, announce that hereafter the manufacture of their *Etching*

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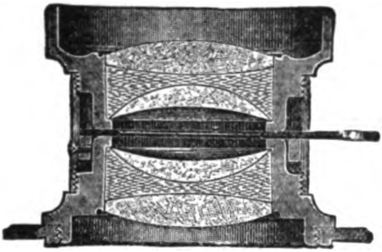

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❧

Among the awards offered for competition at the convention of the Ohio-Michigan Photographers' Association, to be held at Put-in-Bay, Ohio, August 21–23, next, is a prize of $50 in gold in the *open class*. This class is open to photographers everywhere, and two pictures are required, with no restrictions as to subject or size of pictures. The second prize is a gold medal; the third, a silver medal. Competing pictures must be delivered by August 18. Full particulars may be had from the secretary of the Association, Mr. A. L. Bowersox, Dayton, Ohio.

❧

A very complete set of supplementary lenses has been placed on the market by Mr. U. Nehring, 16 East 42d Street, New York, under the name of *Nehring*'s *Multichromatic Ampliscopes*. With these it is claimed that the amateur can obtain more than a hundred different lens combinations, which can be used with the ordinary folding camera. The set is apparently composed of seven elements, with an adapter, duplicator, focusing glass and special tube for tele-photography. Mr. Nehring has issued a little pamphlet giving clear instructions in the use of these lenses for making the desired combinations, and those interested should write for a copy.

❧

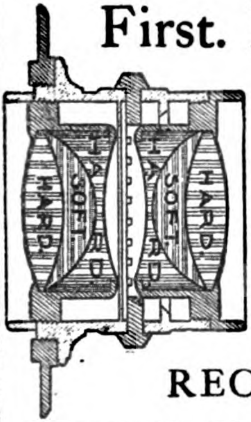
The Eastman Kodak Co. asks us to make known to readers who intend visiting the Paris Exposition that the Eastman Kodak exhibit is situated in the Palace of Education, Champs de Mars, near to the Eiffel Tower and the Avenue de Suffren, ground floor U. S. Section, Group iii, Class xii.

❧

The July number of *Anthony's Photographic Bulletin* offers a more than usually interesting selection of good

TWO POINTS

First. Permanency



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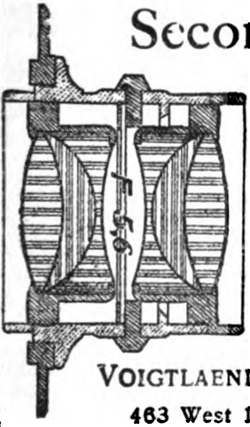

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reading matter. The articles include "Making a Strip Negative" for various test purposes; "Toning with Ferricyanides," a translation of Valenta's report on "Phosphate of Silver Printing Paper;" "Hints on Mounting and Framing;" and an editorial protest against "Fuzzitypes," a portion of which we quote:

"There is noticeable in the work exhibited by the various amateur photographic organizations and elsewhere, during the past year, a growing tendency to get as far away as possible from what most people of intelligence have always believed to be the best and distinguishing characteristics of photography, and an increasing effort on the part of many, some of whom have done good work in the past, to pass off as good photography examples that, in their own earlier days of experimenting, would, without hesitation, have been consigned to the ash barrel. If this movement were to be taken seriously, it might be viewed with some concern, but when its devotees go to the extent of producing a so-called portrait (full-face), in which it is a matter of doubt whether the eyes of the sitter were opened or closed when the exposure was made, we are inclined to the belief that homœopathic treatment will shortly prove effective, and that a little more of the same kind will work a permanent cure. It is to be hoped that the pendulum has swung far enough in this direction and that it will shortly begin its return to a normal condition of things, under which portraits of people possessing the customary organs of sight, smell and hearing may be made to show these features as they appear to the eye of the observer, and not as they may seem to appear to a disordered mind, seeking the grotesque in Nature."

Speaking of the *Bulletin* reminds us that its wide-awake editor, Mr. W. I. Scandlin, deserves a word of praise for the many excellent translations he gives from articles of interest published in the German and Austrian journals. But for his foresight in devoting a portion of the *Bulletin*, month after month, to these translations, the American photographer would be almost wholly without knowledge of what Continental workers are doing and saying.

◆

Negative Notes is the title of a little booklet published for free distribution by the Wagner Exposure Scale Company, 1107 Chestnut St., Philadelphia. It offers some common-sense advice bearing upon exposures under varying conditions, together with the developing formulæ

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issued by American dry-plate manufacturers, and is worth the postal required to secure a copy.

◆

A school of photographic instruction and experiment has been founded at Munich by the coöperation of the Bavarian government with the Association of Photographers of South Germany. The course of studies is directed by G. H. Emmerich, the editor of *Allgemeinen Photographen Zeitung* and seven assistants, and requires a residence of two years for its completion. The school opens October 1, and the terms are stated to be 80 marks per session during the first and second periods, with 100 marks each for the third and fourth periods.

◆

Bulb and Button is the name of a neat little magazine devoted to the amateur photographer, published at Cleveland, Ohio. A special feature is the Department of Criticism conducted by Mr. James F. Ryder, and the journal is announced to be the official organ of the Ohio Amateur Photographers' Association and other Middle States' societies. *Bulb and Button* Publishing Company, Cleveland, Ohio. Price $1, yearly.

◆

Among the many photographic specialties and conveniences on "the other side," which could with profit be introduced to the American amateur, the *Tabloid* preparations of Burroughs Wellcome & Co. are a noticeable example. These *Tabloids* are popular because of their excellence and convenience, offering the purest materials, carefully compounded for specific purposes, and ready for use by simple solution in water. Cannot some enterprising importer or manufacturer make the arrangements necessary to place either English *Tabloids* or an American make on this market?

◆

We have received from Mr. Ben J. Apple, president of the Savannah (Ga.) Camera Club, a copy of the constitution and by-laws of this flourishing organization, which has our good wishes for its continued growth and success.

◆

Mr. Chas. H. Loeber, 12 East 17th St., New York, sends a copy of the revised edition of his price-list. This is one of the handiest dealer's lists issued and is as satis-

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factory in its prices as in other details. We note that Mr. Loeber carries an unusually large assortment of *Kodak Spools and Cartridge Films*, including those required for the new *Kodak Panoram*, also that the prices given for W. & C. Platinotype Papers include the cost of mailing. The separate discount sheet covering dry plates offers the purchaser concessions on his purchases varying from 15% to 45% from list-prices.

❧

We suppose that a majority of our readers see the *Photo-Era* (Boston) with fair regularity as published, but for the benefit of those who do not we give a few of the more attractive features in recent numbers. "Summer Work at the Seashore," by Chester F. Stiles; "Piazza Portraiture" (illustrated); "A Camera Trip to the Old Dominion" (illustrated), in the July number. "C. Yarnall Abbott," an illustrated appreciation, by Osborne I. Yellott; "Portraiture by Flash-light, by D. F. Gay (illustrated); "Chats on Higher Ideals," by Edw. W. Newcomb, in the June number. An illustrated paper on "Mrs. Käsebier's Work," by R. S. Cram; "Harvard University Observatory;" and a review of the pictures shown at the recent Chicago Salon, in the May number. The prose-poems with which Mr. Cummings prefaces his editorial columns are as seasonable as ever, and as readable; and the illustrations throughout the journal show steady improvement in their selection and reproduction.

❧

The special summer number of the *Amateur Photographer* (London) is particularly happy in its illustrations. These include several charmingly decorative studies of leaves and flowers by Mr. A. Horsley Hinton, some clever examples of portraiture at home, and two or three new pictures by Mr. Ralph W. Robinson, of whose work we have seen too little of late.

❧

Among the many interesting photographs of the recent solar eclipse received, mention may be made of a set of five records of the progress of the eclipse made at Harrisburg, Pa., by Mr. J. Horace McFarland. These were made with a lens of 21-inch focal length, on Cramer *Isochromatic* plates, backed with the backing given on page 27 of THE PHOTO-MINIATURE, No. 13. The exposures ranged all the way from $\frac{1}{100}$ of a second with *f*/30 to ¼ of a second with *f*/7.5. Judging by the prints, all

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the negatives were over-exposed, one showing perfect reversal.

During an informal discussion of the eclipse at the last meeting of the Philadelphia Society, Mr. John Carbutt said that he had made special plates for several astronomers, including some 1/16 inch thick "B" emulsion, and others double- and triple-coated and backed. He had developed some of the plates and found that the "A" double-coated produced the best results. The best developer was metol-hydroquinone or metol alone, very much diluted.

Mr. George Vaux, Jr., who showed several fine views made near Norfolk, Va., on the path of totality, used a 17-inch lens on 4 x 5 plates, and afterwards made some very satisfactory enlargements, showing the main characteristics of the corona. Mr. Samuel A. Tatnall employed an objective of 24-inch focus and 1½-inch aperture. He found that there was no apparent difference between the plates made with one second and one-half second exposure.

Samuel Sartain showed a print from an engraving made by him from a negative of the total eclipse, at Burlington, Iowa, on August 7, 1869. The negative was made on wet collodion by John Carbutt.

❧

We are sometimes asked for pointers concerning photography in European countries, a matter about which only those who have had experience can properly advise. An illustrated paper on "Photographing in Switzerland," with many details of interest to the tourist, by Mr. Edmund J. Spitta, may be seen in *Photography*, June 28th.

❧

A practical contrivance for developing roll films (and drying them) in the roll, without cutting or the fingering inevitable in separate development, has been placed on the English market at a moderate cost. If such a convenience were introduced here, it would speedily become popular among the thousands of amateurs using roll films exclusively in their work.

❧

At a recent meeting of the Photographic Society of Philadelphia, Mr. John Bartlett called attention to the fact that it is generally recommended to refix the negative which has been reduced with ammonium persul-

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phate, but where intensification follows reduction, greater strength and brilliancy can be secured by omitting both the sulphite of soda and the hypo bath, and by intensifying with mercuric chloride, following this by blackening the bleached image with sodium sulphite. The reduced silver, he said, forms a good substratum for the deposit of mercury, and he had by this method secured excellent printing qualities in negatives which would otherwise have been worthless. He advised that the intensification should be done in subdued light, as strong light acts injuriously upon the image reduced by ammonium persulphate.

◆

Apropos of Mr. Keiley.—Writing in the *Journal of the Photographic Society of Philadelphia*, Miss Eva L. Watson says: "The persistence with which some mistaken ideas relating to the 'Keiley Method of Glycerine Development' have been repeated, make it necessary that some effort be made to get at the bottom of the matter. Apparently there is confusion in the minds of a few people who are thinking that 'brush development' means 'glycerine development,' and that Mr. Keiley has claimed to be the first to use glycerine as a retarder. Mr. Hinton some time ago published in his book on *Platinotype Printing* some details of a process of brush development introduced by Mr. Willis at the London Camera Club. The method employed by Mr. Keiley differs materially, and is not quite as recent as his generous public demonstrations have been. When his first prints were shown in public, there were a number of experienced workers who were frank enough to acknowledge that the means of obtaining such results were unknown to them.

"Mr. Yellott in a recent article (*Photo-Era*, June, 1900) made the mistake of claiming originality in these experiments for another man whose work is too strong and original to need the backing of unfounded recommendations. Mr. C. Yarnall Abbott, at the private view of the Photographic Salon of '99, asked for an introduction to Mr. Keiley, saying as he met him, 'I believe you are the originator of the glycerine method of manipulating prints.' I am sure a sincere man will not object to being quoted and thus readily righting a mistake which must be annoying, in that it places him in a false position.

"It might be said just here that a 'Vignette in Platinum,' by Mr. Alfred Stieglitz, is the first print on

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record showing the use of the two colors in development. [First exhibited, we believe, at the exhibition of the R. P. S., London, 1899, and there awarded a medal.—Editor P-M.]

"Another theme which has been harped on are some words of Mr. Keiley's, expressing a general appreciation of the big and uncompromising spirit in which the Chicago Salon Committee treated the cause—realizing so fully the importance of this new movement and making a record in its progress. The Salon Committee is not likely to misconstrue anything said in 'The Foreword' printed in the Exhibition Catalogue into an expression of egotism or patronage. * *

"The recent exhibition of Mr. Keiley's work on the Club walls gave a fair opportunity to discover something of his purpose and his range of subjects. They are the expressions of a strong personality, mostly showing great simplicity and much feeling. The interest is always concentrated, and if occasionally the motive seems somewhat vague, it is possible that it is not studied with such responsiveness as a subtle expression requires. When a fault in drawing is very evident we may congratulate ourselves that we are able to detect it, and not fancy the artist is blind to it. It requires much schooling to draw perfectly, and many great painters never succeeded in doing it. There seems to be much disagreement as to the legitimacy of his work, but its value grows with association."

We republish this tribute from Miss Watson with much pleasure. Mr. Keiley has done much remarkably strong work both in and for the advancement of American photography, for which he deserves all possible credit. At the same time we may add that it did not occur to us, in reading Mr. Yellott's article in *Photo-Era*, that he claimed priority in glycerine development for Mr. Abbott, but rather that he desired it to be understood that Mr. Abbott was working along original lines in that department contemporaneously with Messrs. Keiley and Stieglitz.

◆

M. Demachy's account of the American photographic display (or the lack of it) at the Paris Exposition, will doubtless be interesting to our readers as supplementing the report given on page 94 of our last number. We extract from the excellent report given by M. Demachy in the London *Amateur Photographer:*

"The Americans are disappointing, the New York

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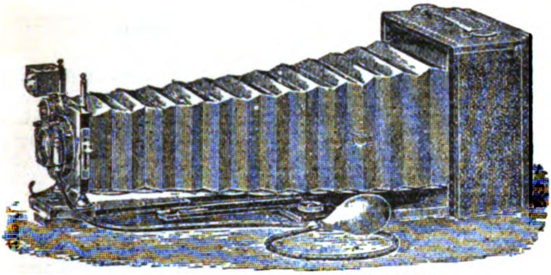
Camera Club, followed by the most distinguished pictorial photographers of the United States, having decided to boycott the French Exhibition on account of the actual regulations, which do not allow of photographs being exhibited in the Fine Arts Palace, exclusively devoted to modern and retrospective painting, engraving, drawing, and sculpture. We are the very first to regret this decision, which deprives us of the profitable study of many remarkable works, and we are sure that our trans-Atlantic colleagues will experience a similar feeling of regret when they will have visited the English representative collection, the Vienna Camera Club, and the Photo Club exhibitions; also when they will have passed through the galleries of the Grand Palais des Beaux Arts and appreciated the masterpieces of art it contains. For I am afraid that the very best of pictorial photographs would have made a very poor show indeed in such august company, and that after several miles of such paintings nobody would have stopped to look at them. This is not personal to American photography, of course; our photographs, in the same conditions, would have had precisely the same fate.

"And, from another point of view, that of the education of the public, who, we are obliged to acknowledge it, is absolutely ignorant as a whole of the pictorial movement of photography, is it not wiser to show our actual attempts and experiments side by side with the old-style photograph and let the public compare, than to force ourselves upon its vision when it has been saturated with colour and to ask for its impartial verdict when it has feasted its eyes on the masterpieces of the very first artists of the whole world?

"The result of this decision is that America is represented by Baker's Art Gallery—genre pictures, painted backgrounds and sentimental posing, with such Christmas number titles as 'The Old, Old Story,' 'The Song of the Kettle,' etc.; by the pretty and over-retouched models of Stenckel, and the enlarged snap-shots of the Eastman Company. Also by some extraordinary photos of crowded auditoriums, all the figures on the extreme ends of the picture being distorted in a hideous gutta percha fashion by the badly corrected lens. Still, there are two small oval portraits by W. N. Brenner, of Cincinnati, that have escaped the Draconian rules of the American clubs. They are quite charming."

Well done, Mr. Brenner! To be thus singled out for praise by so skilful a portraitist as M. Demachy is encouragement indeed.



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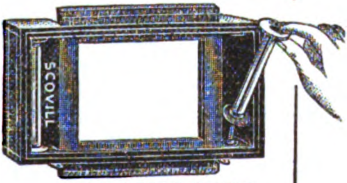

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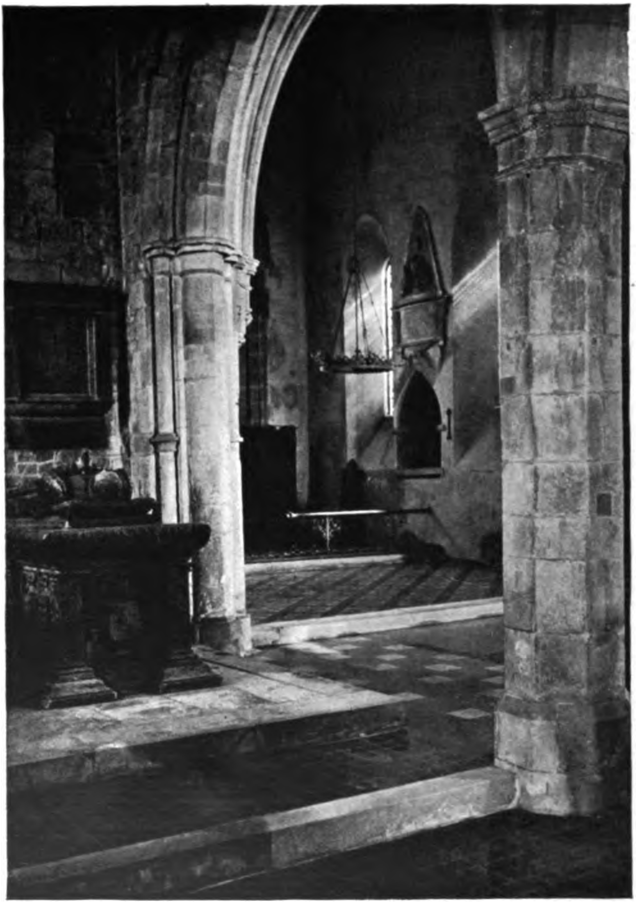
Some days ago we enjoyed a few minutes' chat with Mr. Herbert Ward, formerly connected with Messrs. Wellington & Ward, of Elstree, England. Mr. Ward is visiting the United States and Canada, in search of rest and a change of scene, and gave a cheerful account of the condition of photographic trade in Britain. Messrs. Wellington & Ward, who have made for themselves a prosperous business in photographic printing papers, have recently introduced negative paper films in spools, for daylight changing and roll-holders, as well as in cut sizes. The new films are said to be exceedingly convenient in manipulation, and to yield negatives of very desirable quality.

◆

A correspondent points out that American photographic journals seem to wholly neglect the many valuable technical papers appearing in the German and Austrian periodicals devoted to photography. The complaint is, in a sense, reasonable, but experience tells us that it is by no means easy to find a translator capable of the task of handling the German exchanges except at an exorbitant figure. We may mention, however, that Mr. W. I. Scandlin, the editor of *Anthony's Photographic Bulletin*, usually presents in his paper careful digests of the more important foreign articles bearing on photographic practice. In this department the *Bulletin* easily excels its contemporaries.

◆

A novelty in the way of color-screens has recently been patented in England. This consists of two circular pieces of glass, coated with thin films of collodion or gelatine, one film being stained red, the other yellow. The two disks are cemented together, and are intended to be used near the diaphragm of the lens. The yellow disk has a small opening at its center, and the red disk has a larger circular opening. This is said to "allow a certain amount of white light and of green light to pass through the screen and act upon the plate."



WIRKSWORTH CHURCH
W. R. Bland
Philadelphia Salon, 1899

THE PHOTO-MINIATURE
A Magazine of Photographic Information
EDITED BY JOHN A. TENNANT

Vol. II JULY, 1900 No. 16

BROMIDE PRINTING AND ENLARGING.

What is bromide paper? It is simply paper coated with gelatino-bromide of silver emulsion, similar to that which, when coated on glass or other transparent support, forms the familiar dry-plate or film used in negative-making. The emulsion used in making bromide paper, however, is less rapid (less sensitive) than that used in the manufacture of plates or films of ordinary rapidity; hence bromide paper may be manipulated with more abundant light than would be safe with plates. It is used for making prints by contact with a negative in the ordinary printing frame, and as the simplest means for obtaining enlarged prints from small negatives. Sometimes bromide paper is spoken of as a development paper, because the picture-image does not print out during exposure, but requires to be developed, as in negative-making. The preparation of the paper is beyond the skill and equipment of the average photographer, but it may be readily obtained from dealers in photographic supplies.

As a commercial article, bromide paper falls into two classes: first, the bromide paper introduced soon after the advent of the dry-plate, which requires a dark-room for its manipulation; and, second, the slower (less rapid) varieties, commonly called gaslight papers, such as *Velox*, *Dekko*, *Vinco*, *Cyko*, etc., which are so feebly sensitive that they may be handled, carefully, in weak daylight or artificial light. The chief difference between the papers of these two classes is .in their rapidity or sensitiveness; but there are other points of difference which prevent us from considering both classes at the same time. The manipulation of the "gaslight" papers, however, was briefly dealt with in THE PHOTO-MINIATURE, No. 8: *Photography at Home*, and may, for the present, be left out of consideration. In these pages we will use the words bromide paper to cover the older and more rapid varieties, well known and much used by commercial workers here and popular among British amateur photographers, but which is little known or appreciated by American amateurs.

Some Uses and Advantages. What are the practical advantages of bromide paper? In the first place, it renders the photographer independent of daylight and weather as far as making prints is concerned. It has excellent "keeping" qualities, i. e., it does not spoil or deteriorate as readily as other printing papers, even when stored without special care or precaution. Its manipulation is extremely simple, and closely resembles the development of a negative. It does not require a special sort of negative, but is adapted to give good prints from negatives widely different in quality. It is obtainable in any desired size, and with a great variety of surfaces, from extreme gloss to that of rough drawing paper. It offers great latitude in exposure and development, and yields, even in the hands of the novice, a greater percentage of good prints than any other printing paper in the market. It offers a range of tone from deepest black to the most delicate of platinotype grays, which may be modified to give a fair variety of color effects where this is desirable. It affords a simple means of making enlargements without the necessity of an enlarged negative. It gives us a ready means of producing many prints in a very short time, or, if desired, we may make a proof or enlargement from the negative fresh from the washing tray. And, finally, if we do our work faithfully and well, it will give us permanent prints.

The bromide papers available in this country at present are confined to those made by the Eastman Kodak Company and the Nepera Chemical Company. Better papers could not be desired. In England the worker has a wider variety of brands to choose from. Among them the papers made by Wellington & Ward, Elliott & Son, and Kodak Ltd. may be mentioned as equally desirable. Broadly speaking, all bromide papers are made in a few well-defined varieties; in considering the manipulation of the papers made by a single firm, therefore, we practically cover all the papers in the market. As a matter of convenience, then, we will glance over the different varieties of bromide paper available, as represented by the Eastman papers, with the understanding that what is said of any one variety is generally applicable to papers of the same sort put out by other manufacturers.

Different Varieties. First, we have the *Standard* or ordinary bromide paper made for general use. This comes in three different weights: *A*, a thin paper with smooth surface, useful where detail is desirable; *B*, a heavier paper with smooth surface, for large prints or for illustration purposes; and *C*, a still heavier paper with a rough surface for broad effects and prints of large size. Each of these varieties may be had in two grades, according to the negative in hand or the effect desired in the print, viz.: *hard*, for use with soft negatives where we desire to get vigor or contrast in the print, and *soft*, for use with hard negatives where softness of effect is desired in the print. For general use the *soft* grade is preferable, although it is advisable to have a supply of the *hard* paper at hand as useful in certain classes of work. The tones obtainable on the *Standard* paper range to pure black, and are acceptable for ordinary purposes. For pictorial work or special effects other papers are preferable.

Platino-Bromide paper gives delicate platinotype tones, and where negative, paper and manipulation are in harmony, the prints obtained on this paper will be indistinguishable from good platinotypes in quality and attractiveness. This paper comes in two weights, *Platino A*, a thin paper suitable for small prints, and having a smooth surface useful for detail-giving; and *Platino B*, a heavy paper with rough surface, peculiarly suited for large contact prints or enlargements. Both varieties are obtainable in *hard* or *soft* grades, characterized as above.

Royal Bromide is a capital paper in its proper place, i. e., for prints not smaller than 8 x 10 inches, and then only when breadth of effect is desired in the picture. It is a very heavy cream-colored paper, rough in texture, and giving black tones by development, but designed to give sepia or brown tones on a tinted ground by subsequent toning with a bath of hypo and alum. This paper, also, may be had in two grades for *hard* or *soft* effects; it is further adapted for being printed on through silk or bolting cloth, this modification adding to the effect of breadth ordinarily given by the paper itself. I have seen prints on this paper which were altogether pleasing, but subject and negative should be carefully considered in its use. The *Whatman Bromide* (English) is a similar paper. In addition to these varieties there are obtainable several "enamel" bromide papers, some of which have a highly glazed surface possibly useful in certain branches of commercial work; others have a "matte-enamel" or egg-shell surface which, with careful manipulation, yield most desirable prints with pleasing detail and softness.

Choosing Special Papers. As a suggestion to the reader desiring to have at hand a stock of bromide papers, I would advise *Platino A*, or a similar *soft* paper for prints under 5 x 7 inches; *Matte-Enamel* for *soft* effects, or a similar paper, as an alternative; *Platino C* and *Royal Bromide* for *soft* effects, or similar papers, for prints 8 x 10 inches or larger, and for enlargements. To these might be added a package of *Standard B*, and another of one of the above varieties for *hard* effects, to complete a supply for general purposes. The beginner, however, will do well to avoid the indiscriminate use of several varieties of paper. It is better to select that variety which is best suited to the general character of one's negatives and work, and to master that before changing to another. It is true that an expert can get more good prints on bromide paper, from a given number of bad negatives, than another expert can get with the same negatives and any other printing paper; but it is also true that for the best results on bromide paper the variety of paper used should be suitable for the negative. It will be found, however, that this word "suitable" covers, in bromide printing, a much wider range than is offered by many printing papers. In fact there are only two sorts of negatives which will not yield desirable prints on bromide paper: first, an exceedingly weak, thin negative lacking in contrast and altogether flat; and second, a very dense negative in which the contrasts are hopelessly emphatic. Even in such cases, however, it may be possible to modify the negative and so get presentable prints.

A Suitable Negative. The ideal negative for contact printing on bromide paper is one without excessive contrasts on the one hand, and without excessive flatness on the other. A moderately strong negative, such as will require from three to five minutes in the sunlight with a print-out paper, fairly describes it. In other words, the negative should be fully exposed and so developed that there is a fair amount of density in the shadows. I have never been able, with bromide paper, to get the detail in the shadows of under-exposed negatives, such as we see in a good print made on glossy print-out paper. For this reason the use of bromide papers with under-exposed negatives is not advisable. But there are a great many negatives which, while unsuitable as they come from the drying rack, can be easily adapted to the process by slight modifications. A very dense negative, for instance, may be reduced either with the ferricyanide of potash or persulphate of ammonia reducer; and a thin negative with proper graduations can frequently be intensified to advantage in the print. While, as has been said, there is great latitude in the matter of the negative, this latitude should only be availed of when necessary. Local reduction or intensification of the negative is seldom necessary, as better results can usually be obtained with bromide paper by dodging in the printing.

A Few Principles. Thus far we have gained a general understanding of the different papers and the characteristics desirable in negatives. Before we take up the actual manipulation of bromide paper there are a few elementary principles bearing on the important detail of illumination which we must master. These may necessitate a little thinking, but a practical grasp of them will make our after-work much easier, and ensure that fairly good prints from poor negatives will be the rule instead of the exception.

Illumination. In the first place we have often read that a strong light overcomes contrasts while a weak light increases them. Yet how many of us realize when we come to make prints by any process exactly what this means; in other words, how many of us apply the rule in everyday practice? It is very easy to see what is meant by the rule if we will take an ordinary negative, such as a landscape with clear sky, and hold it first six inches from a gas-flame and then six feet. It will be found in the first case that the sky portion is translucent while the clear glass will, of course, be clear; in the second the sky will be opaque and the clear glass still clear. The contrasts have been rendered greater by removing the negative further from the light-source. As this is true in the extreme case given, so it is true in a smaller degree where the distances are only slightly varied, as well as where we deal with the graded portions of the negative instead of with only clear glass and he densest portions. It is this fact that we utilize in bromide printing; and it is because we have such unlimited control over the strength of our light that it is possible with it to get equally good prints from a wide range of negatives. It is very much simpler and more practicable to regulate the strength of the light by increasing or diminishing its distance than by interposing sheets of paper, ground glass, or opal, as is occasionally done with other processes.

The necessity, however, for occasionally changing the strength of our light in this manner may seem to introduce an element of uncertainty into the problem of exposure; but there is another rule which brings it back again to simplicity itself, and enables us to quickly calculate equivalent exposures at varying distances from the light-source. This rule is: "The intensity of illumination varies inversely as the square of the distance from the source of light." For instance, if a given negative requires five seconds exposure at one foot from the light, it will have an equivalent exposure if exposed for twenty seconds at two feet, the square of one being one, and of two being four. It remains then only to apply these two rules to our actual work with bromide paper. The shadows in a certain negative will receive full exposure, say, in eight seconds at one foot from the light; but the high lights of the negative are so dense that no light will penetrate them at that distance from the light in that length of time. Hence a stronger light must be used, or the action of the same light continued for a longer time; but the latter will not do since the effect would be to over-expose the shadows. Hence, knowing that a strong light overcomes contrasts, we move the negative to the distance of six inches, where the rule tells us the equivalent exposure will be one-fourth that at twelve inches, in this case two seconds. Here the shadows get no more light, but it is possible that the high lights of the negative will be penetrated by reason of the additional force of the light. On the other hand we have a thin, flat negative requiring for the shadows two seconds exposure at one foot from the light. Knowing that a weak light increases contrasts we move the negative three feet from the light, and instead of two, give eighteen seconds exposure, the rule telling us that this is equivalent. Thus we are enabled to regulate the strength of our light to suit the character of our negative. But a standard distance of one foot will not suit with all kinds of lights or with all sizes of negatives. If, for instance, our light is a Welsbach burner, giving an intense and comparatively white light, we will find that a normal negative will print too flat if exposed at one foot. In such a case two or even three feet would be a better standard. Experience with our light will, however, furnish the best standard, always taking a standard negative for the tests. But the size of the negative also has its influence on the unit of exposure. For instance, we may have a half-inch oil-burner, in which case we would probably have to expose a standard negative at four inches in order to get the proper contrasts. But this is out of the question with a negative of 5 x 7 or over, as a reference to the diagram, Fig. 1, will clearly show. Here we find that while the centre of a negative is four inches from the light the extreme edges will be over five inches from it, the rule as to intensities telling us that the light at the edges will be only $\frac{16}{25}$ of that at the centre. This would result in a marked falling off of light at the corners, and would necessitate a constant motion of the printing frame throughout exposure, which is not wholly satisfactory. The remedy would be to use a stronger light at a greater distance. But another reference to Fig. 1 will show that if a 5 x 7 negative be held at seven inches from the light the difference will be only as 49 is to 56, which can in practice be disregarded, though it would be better to have it even less. Hence we see that it is never safe to have our unit less than the base-line of our plate, and it is better to have it even greater, as we will frequently be obliged to halve the distance to overcome contrasts. It follows from this that the larger our negatives the stronger must be our light.

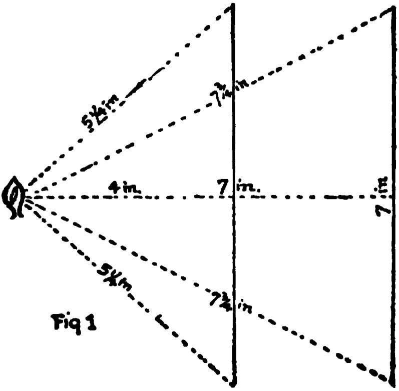


Fig 1

Now all of these considerations may make very dry reading, but the reader who has followed them closely will see how vital they are to successful work. It should not be thought, however, that every exposure on bromide paper must involve an arithmetical calculation. On the contrary, once the proper distance from the light for the normal negative has been ascertained, it will be found that nine negatives out of ten will require no change in the distance from the source of light. This, of course, presuming that we classify our negatives and enlarge from those of the same quality at the same time.

Dark-room Light. One great objection to the use of bromide paper is that it must be handled in a dark-room. But this objection is not as serious as it may seem. An ordinary living room at night furnishes a delightful place in which to make prints, if we handle our solutions with reasonable care. The ruby glass can be removed from the dark-room lamp, and the orange glass used alone. But in this case, as indeed with the ruby light, care must be taken to guard against too much light. Development should be conducted at a distance of several feet from the light, and when almost completed, the tray can be brought close under the light to enable the worker to stop it at exactly the right moment. Ordinary bromide paper is about as sensitive as the Carbutt B-16 dry plate or the average lantern-slide plate, and requires as much care as either, but not nearly so much as the most rapid dry plates. If fogging is noticed, of course additional precautions should be taken at once.

Apparatus. Nothing more than will be found in an ordinary dark-room will be found necessary in bromide printing by contact, unless it be some arrangement for determining readily the distance of the negative from the source of light. For this purpose and with an oil-lamp, use a board a foot wide and about three feet long placed on the developing bench against the base of the dark-room lamp. It should be marked with black lines six inches apart. See Fig. 2.

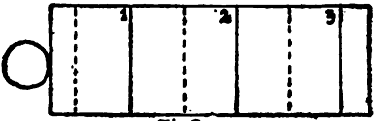


Fig 2.

Reflectors. Greater uniformity in lighting will be gained if a piece of white cardboard be placed immediately behind the flame. Some lamps have reflectors, in which case the card is unnecessary, provided that they reflect the light uniformly; otherwise such reflectors are worse than useless.

Developers. Having arranged the needful apparatus to our satisfaction, the last preparatory step before manipulation is the making up of a developer. Almost any of the modern developers (pyro excepted) will give good results with bromide paper. In every package of paper will be found the developers advised by the manufacturer of the paper used. Invariably there is among these a formula for ferrous oxalate developer. This is probably the best of all developers for pure black tones, but I cannot advise the novice to take it up in the early stages of his work with bromide paper. When this developer is used an acid clearing bath is necessary, and this invites complications which may be disastrous to the prints. When experience has been gained, and a large number of prints are to be made at one time, it will be found advantageous as working longer with greater efficiency and more uniformity than some of the other developers. It is troublesome to prepare and does not keep well, apart from which there is the disadvantage that it does not permit of control in development in as large a measure as other developers.

A reliable metol and hydroquinone formula is as follows: Thoroughly dissolve metol, ¼ ounce; hydroquinone, ¼ ounce; in water, 80 ounces; add sulphite of soda (cryst.), 4 ounces; and carbonate of soda (cryst.), 2½ ounces. Bottled in 4-ounce vials and well corked, this developer retains its working power indefinitely. For normal exposures I take 2 ounces of the above and add to it 2 ounces of water. This will suffice for the development of three 8 x 10 sheets of paper, or their equivalent in smaller sheets. It is not wise to attempt to make it do more, as greenish tones will result. For the same reason, contrary to common opinion, I do not advise the addition of potassium bromide to the developer. It does not improve the developer, and may do harm.

An excellent developer which must be used freshly mixed, and may be made up in a moment, is as follows: Take 1½ ounces of a 25 per cent solution of sodium sulphite; dry amidol, 30 grains; 5 to 10 drops of a 10 per cent solution of potassium bromide, and dilute with 4½ ounces of water. A supply of new developer should be added as this is seen to become exhausted.

Other developing formulæ could be given, but these two will be found to fill all requirements if properly compounded and intelligently used. Of the commercial preparations, *Ortol Tubes*, *Celeritas* and *Tolidol* have all proved satisfactory and may be used with confidence.

The greatest difficulty in developing bromide paper is to get rich black tones when desired, but this can be completely overcome by using entirely fresh developer from time to time, and never over-working the developer, whatever it may be. As compared with the paper, developer is cheap, and it is poor economy to save on the latter.

Modifying the Developer. Except in rare instances the developer is better without any modifications whatever. In case of over-exposure, either general or partial, the developer after having been diluted as stated should be again diluted with its bulk of water. This gives blacker tones and more depth and life to the shadows. When through inadvertence we under-expose a print it may frequently be saved after partial development in the weak solution by flooding with a strong undiluted developer.

Temperature. The temperature of the developer is of the greatest importance. In summer the aim should be to keep it approximately at 65 degrees Fahr., in winter, 70 degrees, but it should never be allowed to go over the latter. This can readily be accomplished by placing the graduate in a receptacle containing ice-water in summer or hot water in winter.

Details of the Process. The paper is first opened at a safe distance from the dark-room light, and it is well at first to cut up one sheet into several slips to use as test-strips. If any difficulty is found in determining which is the sensitive side, it will be well to throw a piece of the paper on a plane surface, when it will be seen that it has a slight tendency to curl. The concave is the sensitive side. Taking a standard negative we first take one of the test-strips and place it upon the negative so that it covers a portion containing both high lights and shadows. With an oil-lamp having a 1-inch burner, expose the test-strip behind the negative in the printing frame at one foot for ten seconds. Close the lamp and flood the exposed strip with the developer. The image should appear in a few seconds, and if properly exposed development will be completed in from one to two minutes, usually one. Rinse for a moment and place the strip in a fixing bath made up by dissolving 3 ounces of hypo in 16 ounces of water. After a few moments examine the strip in full light, and see whether the contrasts are right. If so, expose a full sheet of paper, this time rinsing the exposed sheet before development to avoid the formation of air-bubbles. If the contrasts are too great try a strip at six inches from the light and two and a half seconds exposure. If still too great, use a stronger light or try a longer exposure and use a very dilute developer. If still too great the negative is hopeless and should be reduced unless dodging will help it, as set out further on.

Exposure. It will be noticed that this method calls for a one minute development. This is desirable for several reasons: first, because it gives a unit and assists us in determining the correct exposure of other negatives, and second, because it is a comparatively short development, and yet gives sufficient time after the image has acquired the proper depth to pour off the developer and flush with water, thus stopping development. It also leaves sufficient margin in the event of over- or under-exposure. With one minute as the unit, over-exposure will result in a fully developed image in, say, thirty seconds. This print we could save; but if our unit were thirty seconds it would be extremely difficult to save a print which had completed development in fifteen seconds. The chances are that the development would go on to a ruinous extent before we could pour off the developer and flood the print, or that it would go on even after the water was poured on it. Moreover, in case of under-exposure, two minutes would not be so very tiresome, but four minutes would, besides which we would risk straining the print by such prolonged development. While I am not prepared to assert it as a rule, yet it has been my experience that the time of development varies almost inversely with the length of exposure; so that if the test-strip concludes development in half a minute with ten seconds exposure, I give the next five seconds exposure in the expectation that it will take a minute to develop. This assists greatly in lessening the number of test-strips required to ascertain the correct exposure of a given negative.

Proofs from Wet Negatives. Should we wish to see a proof before the negative is dry, it is taken from the fixing bath and well rinsed, though not necessarily thoroughly washed. It is then placed face up in a tray of water, on which we place face down a sheet of bromide paper. The two are removed together and squeezed lightly into contact to remove air bubbles. The back of the negative is then wiped to remove superfluous water, and an exposure of several times the normal given, preferably the normal exposure at half the standard distance from the light. The paper is then removed and developed as usual. In this way it is possible to show a print in fifteen or twenty minutes after the exposure of the plate was made.

Rinsing the Paper. The purpose of the rinsing before development is to avoid the possibility of air bells. The paper should be rinsed in cold water, as warmish water will cause air-bells instead of preventing them. This rinsing can be dispensed with if thought desirable. The rinsing after development is for the purpose of stopping development immediately, and also in order that the prints may not go into the fixing bath full of developer, as staining would be likely to result in such case. With the iron oxalate developer an acid rinsing bath is necessary, but it is not necessary with any of the other developers.

Fixing. The fixing is important, as upon this depends in a large measure the permanence of the prints. The bath should be freshly made up, 3 ounces of hyposulphite of soda to 16 ounces of water. Prints are placed in this bath face down, and one under, instead of on top of another. The tray should be occasionally rocked. With a fresh bath prints will fix in ten minutes, but where many prints are made at one time it will be well to use a second fixing bath. The emulsion of an unfixed print will appear a yellowish tinge in the unfixed portions when examined by transmitted light; but this is not an easy or certain test. It is better to make absolutely certain of thorough fixing by continued immersion, occasional rocking and, where many prints are made, a second bath. The fixing bath should not be allowed to get too warm in hot weather. Blistering, staining and frilling will result in such a case, and I have known a print which was left in a warm fixing bath for an hour or more to be reduced beyond redemption. With freshly made hypo baths at a suitable temperature there is absolutely no danger of the paper frilling or blistering.

The Final Washing. The final washing must be thorough, as the hypo is difficult to eliminate from both the emulsion and the paper. Care must be taken to see that the prints are well separated while washing. This ensures uniform washing.

Printing Dodges. It frequently happens that a negative may require more or less dodging in printing. With bromide paper this is particularly easy. We will take the simple case of a negative with a dense sky which will not print out in the ordinary way. All that we need in this case is a piece of paper cut roughly to the sky line and kept moving during part of the exposure over the part which is to be held back. If necessary, cut down the light in order to prolong the exposure, or expose at a greater distance from the light. One or more test-strips will be required for this purpose in order to ascertain the relative times of exposure. A modification of this method is when a small portion of the negative only needs extra printing—a face or hand for instance. Here we take a piece of paper a little larger than the negative and cut a small hole in it, moving it in front of the light so as to throw the latter only upon the portions needing the extra printing. Still another modification is where a portion only needs holding back. Here we use a small piece of paper or cardboard stuck on a knitting needle, moving the latter so that it will not intercept the light too long at one place.

In all these and similar instances which will occur to the reader, the dodging should be done during the first part of the exposure. The subsequent exposure seems to obliterate traces of such dodging better than when it is done at the end of the exposure, just as in cloud-printing better results are achieved by printing the sky first and the foreground afterward.

Paper Negatives. It is quite possible to make bromide negatives in the camera. They have their advantages in classes of work not requiring the finest definition, are much lighter, cheaper, more easily stored and less liable to breakage or other mishaps. They are best made on a thin, smooth paper, such as *Standard A*, the *soft* paper being better than the *hard*. They are placed in the plate-holder by means of the ordinary cut film holder. The exposure required is ascertained by a trial or two, but roughly speaking is about ten times that of a rapid plate. After development in the usual way—it being carried only a little further than usual—and after fixing, washing and drying, the paper negative can be spotted or retouched, the paper furnishing an excellent medium for retouching. It is then immersed in a tray containing melted paraffine, withdrawn and drained. It is then ironed with a hot iron between blotters, and is ready for printing. Printing must be done in subdued light, as otherwise the grain of the paper would be too evident. These negatives are not suitable for printing on glossy papers, but give excellent results on papers with a matt-surface.

Making Enlargements. In taking up enlarging a full knowledge of what has been said as to the manipulation of bromide paper will be necessary, as the principles governing exposure apply here as in contact printing, errors being even more serious, owing to the greater waste of material.

Choice of Illuminant. For the illuminant used in enlarging, we may employ either daylight or artificial light. The former is cheap, but variable; the first cost of the latter is quite a little sum, but the light is uniform. A daylight enlarging apparatus can be made for a dollar or two, and hence is within the reach of all; and if the process be given up, the loss is not serious.

If the cost is of little or no moment, very serviceable enlarging cameras can be bought for about twenty-five dollars. Such a camera is adapted for reducing as well as enlarging, and so will be found useful for lantern slide making, copying, etc. The *Ideal* enlarging lantern made by Burke & James, or the instrument made by Ross Ltd., are excellent for this purpose.

Daylight Enlarging. We will first consider enlarging by daylight with home-made apparatus. For this purpose a room with at least one window will be needed. It should preferably be convenient to the dark-room. If the window of this room commands a view unobstructed by buildings, trees or the like, so much the better. I personally prefer a south light. With this one can get soft enlargements from the most contrasty negatives, while by shielding the negatives from the direct rays of the sun we can work from negatives which are quite flat and lacking in contrasts.

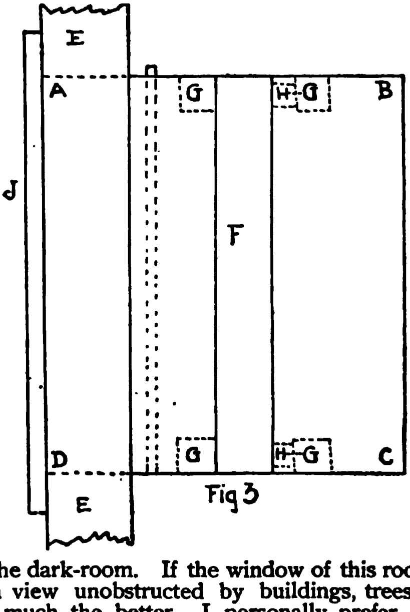


Fig 3

The Enlarging Room. But whatever the room chosen, all windows but the one at which we are to work must be blocked up. This can be done by heavy dark curtains, or by specially constructed frames covered with light-tight material, and made to fit closely in the windows. If there are any transoms, these should likewise be covered. White light entering under the doors can be shut out by placing a rug along the bottom of the door. Care must be taken that the window-frames fit closely, as the light from openings at the windows would soon fog a sheet of bromide paper if it fell upon it even for a few moments.

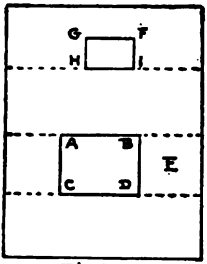


Fig.4

Apparatus. Assuming that the room chosen can be made practically light-tight, we will need some arrangement to hold the negative. The details of a box for this purpose can best be shown by a diagram (Fig. 3). ABCD is a strong and neatly made box open at both ends, and about two inches larger each way than the largest negative from which enlargements are to be made. E represents a section of a board which forms part of a window frame, a general view of which is given in Fig. 4. Reverting to Fig. 3, F is an opening cut in the side of the negative box two inches or a little less from the back of the box, AD, and wide enough to admit the free passage of a negative in a kit or other holder. On the inside of the box are tacked strips, GGGG, to serve as a guide to the kit when placing it in the box. An opening similar to F should be made in the other side of the box to permit lateral adjustments when we come to use the apparatus, besides enabling us to put the negative in or withdraw it from either side. A convenient modification of the strips, G, is found by placing the front ones a short distance further forward, to wit, toward BC, as they are shown in the cut (Fig. 3), and tacking to them a piece of watch spring, H, this then serving both as a guide and as a means of pressing the kit or negative holder against the other strips, GG (Fig. 5).

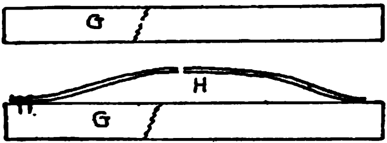


Fig 5

J is a sheet of ground-glass, which is tacked over the opening when the box is firmly set in the board, E. It is well to have this ground-glass fixed in place so that it can be readily removed if desired.

The necessity for having the box at least two inches larger each way than the largest negative from which enlargements are to be made in shown in Fig. 6. Here AB represents the negative in place, CA, DB and EG represent rays of light entering the box. It will be seen that the rays CA and DB strike the ground-glass at an angle, but nevertheless at an angle which results in their passing through it in a considerable degree. They strike the negative AB, but if the negative were the full size of the box, to wit FG, it will be seen that while the section AB would be fully lighted, the sections AF and BG would receive no oblique rays at all, and hence the negative would not be even approximately uniformly lighted. This point is too often overlooked in the construction of apparatus of this character, but is necessary in all cases of daylight enlarging and especially when direct sunlight is used. Now with the negative box in place, some arrangement must be made for holding the lens, which can be the lens used for making the negative. This for enlargements of a fixed size from negatives of a given size can be accomplished by simply extending the section BGGC Fig. 3, to a proper distance and placing the lens in the end of it; but this permits too little opportunity for adjustments and is not advisable. A double box, one sliding within the other would be better, but still not quite satisfactory. It is far better to adapt one's camera to the apparatus, and this can always be done; it being very simple with a reversible back camera, which can be backed right up to the opening, and more difficult but always possible with others. Fig. 7 shows the entire apparatus in place, and the manner in which it is used. AB is the window board, C is the negative box, D is the camera adjusted to the latter, E is the enlarging screen on an easel to hold the bromide paper, and F is the reflector. The screen on the easel can be made either to rest on the floor or on a table. It can be made to run on a track or otherwise, and it can also be made so as to admit of either vertical or lateral adjustment or both, or it can be nothing more than an ordinary box set on a table. But however constructed it must be considerably larger than the largest sheet of bromide paper which is to be

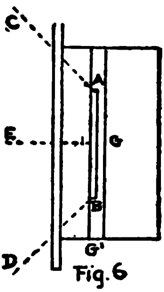
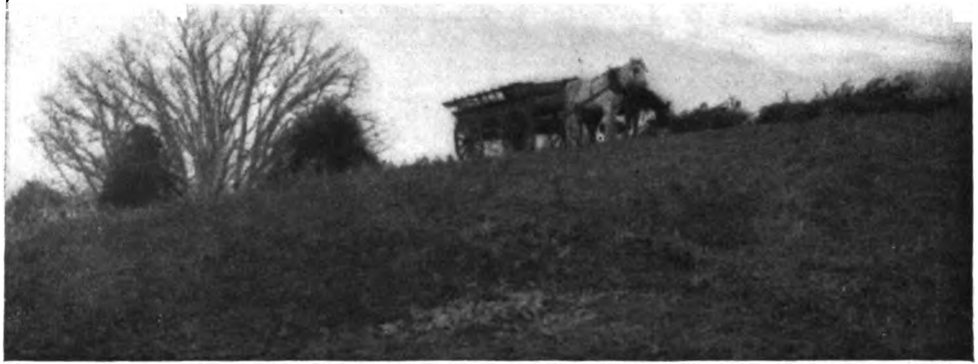


Fig. 6

By F. C. Baker



THE LAST LOAD
J. Whitall Nicholson
Philadelphia Salon, 1899

used, thus allowing for nearly all necessary adjustments of the paper. It is preferably covered with white paper or fine blotter to aid in focusing. The reflector F is considerably larger than the negative-box, and adjusted at an angle which will reflect the light from the sky or sun evenly upon the ground glass. It is best covered with good white blotting paper. G is a hood which I have found useful in sunlight enlarging, especially in summer when the sun is almost overhead. It is placed on the outside of the window-frame, some distance above the ground-glass, and shields the latter from the direct rays of the sun, which would otherwise cause uneven illumination owing to their too great obliquity. The direct sun on the white reflector will give a light of high intensity. In winter, however, when the sun is low, it will fall directly on the ground-glass, and this, if the negative box be constructed as advised, is not objectionable, but on the contrary an advantage. In Fig. 4 the opening, FGHI, represents a sheet of ruby glass, and can be screened while focusing if found to interfere with the worker's convenience in that operation.

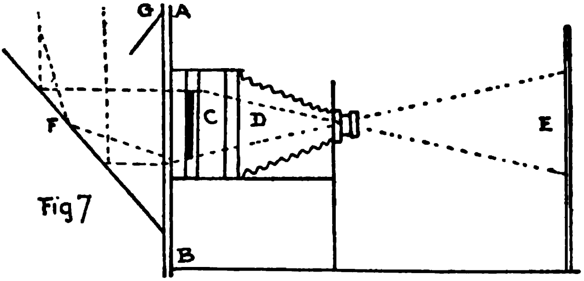


Fig 7

Modifications. The apparatus as sketched will suffice for all ordinary work. Modifications of it will depend upon the ingenuity of the man who attempts to design or construct one. It should be noted that the distance of the ground-glass from the negative has its influence in the strength of the light, and it is better to have this distance not over two inches. If less than one inch, however, the diffusion of light is not so good. When the light is weak the ground-glass can be removed entirely; the negative will thus be viewed directly against the white reflector. Very strong negatives giving undue contrasts may also be dealt with in this way. Or, if the light is too strong for flat negatives, the reflector can be removed entirely, or to the same end a sheet of yellow glass can be substituted for the ground-glass, thus increasing contrasts. In fact, a very useful and easily arranged modification of the negative-box consists of an opening in the top of the box inside the room through which can be dropped an extra sheet of ground-glass or opal to cut down the light, or of yellow glass to increase contrast. This opening should be at the point K, Fig. 3.

I have referred to a kit as being the proper arrangement for holding the negative. This, after much tribulation in working with home-made contrivances, I have found to be the best arrangement. They come a size or two larger than the negative with which they are to be used, and can easily be cut down to the proper dimensions. With it, also, other kits to hold smaller negatives can readily be used. It is also simple with them to fasten the negatives in place. If they extend beyond the box on either side so much the better; greater lateral adjustment can then be made. The negative box, Fig. 3, is best painted dead black inside in the section GBCG, and white in the section AGGD. The reasons for this will be obvious at a glance.

Enlarging from Films. In enlarging from films it is well to place them between two sheets of glass of proper size, and fasten the whole in the kit or negative-holder. For this purpose use thin glass without flaws or scratches. If the films are smaller than the opening in the kit, it is well to paste a black mat on one of the glasses, when, after proper adjustment, the film will remain in place between the two glasses with very little pressure.

Enlarged Negatives. Enlarged negatives are very easily made with the apparatus described. A contact positive can be made, preferably on carbon transparency tissue, and from this the enlargement made, or an enlarged positive made first, and from this a contact negative. The latter plan is preferable, since it admits of retouching on both positive and negative. Slow plates should be used throughout. For those who do not care to go to the expense of experimenting with large plates, I would suggest that good contact positives be first made and from these negatives on bromide paper, *Standard A*, *soft*. These negatives are treated as already described. The best positive for this purpose is a thin one with full gradations of tone from clear high light to deep shadow, without veil or fog, but free from any suspicion of flatness.

Enlarging with Artificial Light. The apparatus for enlarging with artificial light is, as has been stated, more expensive than that for use with daylight. The negative box and screen, however, remain as given. But we need in addition two extra pieces, a light-box and a pair of condensing lenses.

The form of light-box presupposes the choice of illuminant, and in this there is a wide range. Suffice it to say that a kerosene lamp with one or more one-and-a-half inch burners will be found suitable for very small work or weak negatives. For larger work or stronger negatives a stronger light will be needed.

The Light. Of these, the first in point of strength is the arc-light, which is too strong for ordinary negatives to be enlarged not more than fourfold on ordinary bromide paper. Used with *Velox*, *Dekko* or any of the slower papers it will be found very serviceable and satisfactory. Next comes the lime-light, which has pretty much the same advantages and disadvantages. After these come acetylene, a gas giving an intense light of high actinic power. This is within the reach of nearly all, as a first-class generator costs only about twelve dollars, and the uses of the gas are manifold. The same generators and burners can be used with a projecting lantern and will be found far more satisfactory than oil. Acetylene burners can be had in various sizes, ranging in power from thirty to several hundred candle-power. The carbide from which the gas is generated is not expensive and costs only a few cents each time the machine is loaded. By an adjustment attached to the generator the gas is kept at a constant pressure, and hence the light is unusually steady. All in all this light has many advantages. After it in strength comes the Welsbach burner, suitable for those having gas in the house. After this comes the ordinary gas-burner, and then oil. The reader, knowing now what will be required of his light, can take his choice.

The Light-Box. Perhaps the simplest form of light-box is where the light is placed in one room and the enlarging done in an adjoining one, the light being admitted through a suitable opening. This prevents the possibility of stray light reaching the paper and is productive of no additional heat in a room presumably already hot enough.

If this is not feasible a light-box must be constructed. As these vary so much in material and design, and must be altered with different forms of light in use, I will merely state the requirements. First of these is that it must be light-tight, and second, that it must have adequate ventilation and be fire-proof. Following these in importance, there should be a simple arrangement for looking at the light from time to time to see that it is burning properly and some means for readily attending to it if it is not.

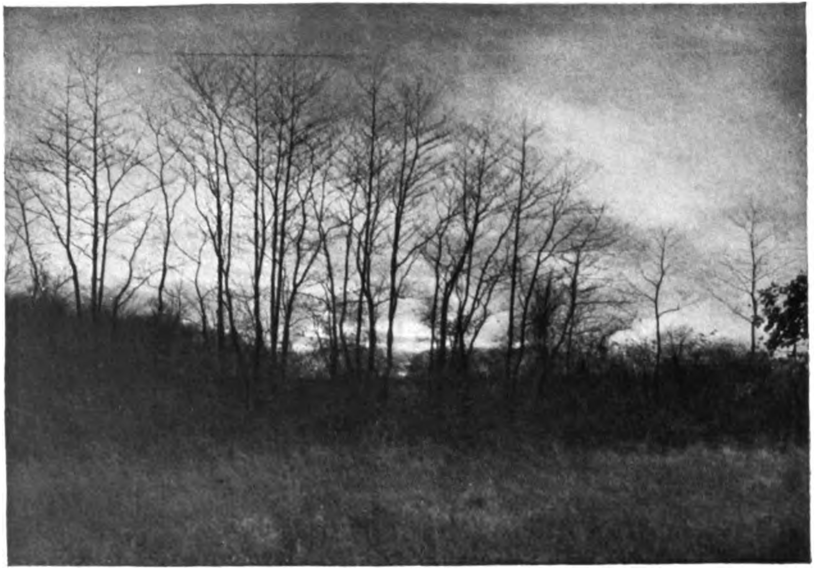
Having the light-box, the burners must be placed in it properly. Here the shortest way out of the difficulty is to go to an expert. If electricity is used go to an electrical supply house; if gas, go to a gas-fitter. As will be seen later the flame itself must be placed in a certain relation to other portions of the apparatus, and provision must be made accordingly.

The Condensers. In looking over the magazines and annuals we will now and then see some new method given for illuminating evenly the back of a negative in enlarging or reduction. The most of these the writer has tried, but he has never found one of them which could be relied upon to give even reasonable satisfaction. If the light is apparently evenly diffused it is too weak. If strong enough it is not evenly diffused. Hence I will recommend nothing short of a pair of condensing lenses, as these have been proved by experience to be satisfactory in every respect if properly handled and cared for. The diameter of these must be slightly greater than the diagonal of the largest negative from which enlargements are to be made. These can be bought in pairs, mounted or unmounted, at about the following prices:

Diameter Inches	Focus Inches	Pair of Lenses Mounted	Per Single Lens Unmounted
4	5½ or 6½	$4.00	$1.25
4½	5½ or 6½	6.00	1.50
5	6½	7.50	1.75
6	8	12.00	3.00
8	12	32.00	7.50
9	14	40.00	10.00

The prices asked for condensers vary considerably in in different price-lists. In Britain the cost of condensers will range from one-third to one-half less than the prices here given from an American list.

Mounting the Condensers. If it is desired to save the additional cost of the mounted condensing lenses, they can be comparatively easily mounted by anyone at all familiar with tools in the following manner:



IN DECEMBER
J. Whitall Nicholson

THE DYING DAY
W. H. Ingram

A piece of quarter-inch pine or poplar is cut to a square about an inch larger than the diameter of the lenses. In the center of this is sawed out a circular opening the exact size of the lens. In another board of the same dimensions is cut a circle a quarter of an inch less in diameter. These boards are placed together with the grain running in opposite directions, to prevent warping, and the lens kept in place by a wire bent in a circle and clamped in place so as to hold the lens, or other similar arrangement. See Fig. 8. The other lens is mounted in the same way. The two are mounted with their convex sides facing each other and a slight distance apart. It is better to place between them a thin sheet of finely ground glass, as this overcomes the bad effects of slight flaws in the lenses, which are not uncommon. The combination is then boxed up.

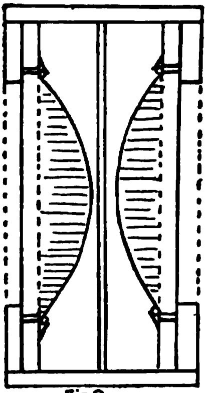


Fig 8

Having now our light-box, condensers, negative box, camera and screen, they are next arranged in the order shown by Fig. 9. A long table especially constructed for the purpose makes the best base for this purpose.

In putting the apparatus together there are several points to be noticed. First, the planes of the lenses, negative, projecting lenses and screen must all be parallel; second, the centers of all these should be in a single straight line, and third, either the light or the condensers should be so mounted as to easily slide backward or forward, since every time the projecting lens is racked backward or forward it necessitates a corresponding motion of the condensers to or from the light.

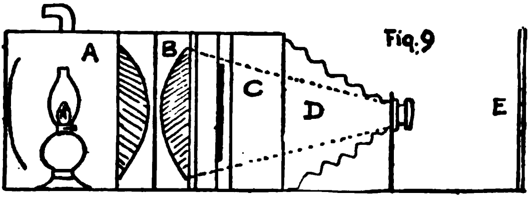


Fig. 9

In constructing the apparatus, for use with condensers and artificial light, the same provision should be made in the negative box for inserting a piece of colored or ground glass as was made in the daylight apparatus. When the diameter of the condensers is but little greater than the diagonal of the negative it will be necessary to have the latter quite close to the former, as the cone of light from the condensers has its apex at the lens, and hence if the negative in such a case is at a distance from the condensers the corners will receive no light. Reference to Fig. 9 will show this plainly. For this and other reasons it is always best to have the condensers of ample size for a given negative. In fact, before beginning to make enlargements the worker should work with one good negative until he finds out exactly what light-intensity is best suited to it. This will then serve as a standard for all other negatives of the same general grade, and variations of the light can be made as required for particular negatives, or where the extent of enlargement is materially changed for various purposes.

Enlargement Tables. In using the daylight apparatus, which we will now consider, the negative is placed in the holder opposite the center of the ground-glass, upside down and facing into the work room. The room is darkened and lens uncapped. An image more or less blurred will appear on the screen. If the enlarged picture is to be only slightly larger than the negative, the lens must be racked out until its distance from the negative is but little less than its distance from the screen. To make the enlargement greater we simply rack back the lens and move the screen further off. There are tables which show exactly the distance which the lens must be from the negative and screen in order to get an enlargement of a given size. The table here inserted covers the ordinary requirements and may be of service in constructing the apparatus:

TIMES OF ENLARGEMENT.

Total distances from the negative, in inches.

TIMES OF ENLARGEMENT	2		3		4		6	
Focus of Lens	To Easel	To Lens	To Easel	To Lens	To Easel	To Lens	To Easel	To Lens
6 inches	27	9	32	8	37½	7½	49	7
8 "	36	12	42⅔	10⅔	50	10	65⅓	9⅓
10 "	45	15	53⅓	13⅓	62½	12½	81⅔	11⅔
12 "	54	18	64	16	75	15	98	14

Tables for enlargements of from one to twenty-five times, with lenses varying in focal length from five to twenty-five inches, can be found in the annuals. A convenient table is also given in THE PHOTO-MINIATURE, No. 1: *Modern Lenses*. In practice it is convenient, after having once found the focus for a given enlargement from a given negative with the lens in use, to mark on the base of the apparatus the point to which the lens has been extended. Then in making future enlargements of the same size, it is only necessary to set the lens at that point and move the easel backward or forward until an approximate focus is obtained, when the image will be of the proper size on the screen.

As an approximate guide it is sufficient to know that the nearer the lens is to the negative the greater will be the enlargement, as may be seen in Fig. 7. If a piece of thin cardboard, or a sheet of paper cut to the exact size of the enlargement desired, is placed upon the easel-screen, little difficulty will be experienced in getting an enlarged image of the proper size and correctly focused.

Focusing. It is advisable to focus the enlargement with the largest aperture of the lens. If the lens, when working at its largest aperture, covers the plate from which the enlargement is being made, it will give proper definition over the enlargement. With a lens of the better sort, of course, the definition will be equally good whether a large or small aperture is used; but with a low-priced lens it is better to stop down to No. 8 (*f*/11.3) or No. 16 (*f*/16), to avoid spherical aberration. Stopping the lens down increases the time of exposure, and enables one to have greater control over the operation of exposing the paper, permitting time to shade or locally increase the exposure at any portion of the image. This is sometimes useful, but as a general thing stopping the lens down is not advisable, as interfering with one's judgment in calculating exposures for various negatives. Having secured the image correct in size and focus, place thumb-tacks at all four sides of the sheet of paper or card used to focus the image. These will serve as a guide to the placing of the sensitive paper. Adjust the lens stop as desired and cap the lens, leaving the room totally dark save for such safe light as we may have for working. Place the bromide paper on the screen, using the thumb-tacks as a guide to the correct position in this.

Making the Exposure. In making his first enlargements, the beginner should avail himself of the help of test-strips. These should be about one inch wide and the length of the paper. The exposure depends on a number of factors, among which are light, negative, focal length of lens, size of enlargement, stops, sensitiveness of paper, developer, temperature of developer, and length of development. The first experiment had best, therefore, be made on a purely arbitrary basis, for which we will take ten seconds.

Pinning a test-strip on the screen, we uncap the lens and with a piece of cardboard shade two-thirds of the strip during five seconds; move the cardboard, and give the next section five seconds, making ten for the first; then remove the cardboard entirely and give five seconds more, making fifteen for the first, ten for the second, and five for the third. Now develop the strip. If the fifteen-seconds portion finishes development in less than one minute, and the ten- takes approximately a minute, we will know that our basis was correct. But if all three were over-exposed or under-exposed, as shown by one minute's development, we can expose the next test-strip accordingly.

In determining the correct exposure, the method already set forth for contact exposures is a reasonably good one. If the paper with a given exposure takes half the proper time to develop, halve the next exposure; if double the time, or more, double it. More could be said on the subject of exposure, and possibly to advantage; for instance, there are tables showing the exact relation of exposure to the number of times of enlargement, but complicated calculations in the dark-room are troublesome and a test-strip is simpler. After a while one gets the ability to determine the approximate exposure required by looking at the enlarged image on the screen, correcting slight errors by length of development, and greater ones by modifying the developer by diluting or strengthening. It should be remembered, however, that in judging exposure by reference to the screen, we must consider the high lights, as well as the shadows. It is in the high lights that we need the detail if we are to have soft pictures. If this detail in the high lights is plentiful and clear we may know that our light is strong enough for a very short exposure. If it is very faint, we will have to give a long exposure and use diluted developer to save the over-exposed shadows. On the other hand, if the image on the screen is a flat one, we may know that our light is too strong for the negative, and it must be modified by removing the reflector or by interposing ground or yellow glass; and if neither of these suffice, we can simply lay the negative aside for a dark day when the light will be very much weaker. Frequently all necessary contrasts can be obtained by the use of the *hard* paper before referred to. As under-exposure tends to increase contrasts, we should also give the minimum exposure in the case of flat negatives, abandoning for a time our standard one-minute development. As will be seen by this time, there are many wrinkles about using bromide paper, and it will be found that new ones appear at every *seance* in the enlarging room.

But why is it that so many of our enlargements are black in the shadows and chalky in the high lights? Why, simply because our light is too weak for our negative. We forget that if we cannot modify our negative we must modify our light. It is this characteristic of the bromide enlargement which has prevented the process from enjoying the popularity it deserves. And I sometimes wonder whether this chalkiness is due to the use of the north light!

Dodging. Of all printing processes, bromide enlarging offers the best opportunities for successful dodging and modification. We can cut our light down and take all the time we want, or we can take as little time as we want. A hand, a finger, a slip of paper, or anything within reach, will suffice to shade the light just as we want it. In this connection it is well to always hold the shade nearer the lens than the easel, as greater diffusion results and there is less danger of sharp lines. In shading a foreground to bring up a dense sky, first make a test-strip or two, noting how long the shading is carried on and how long the light is allowed to act on the whole. If the sky is then over- or underprinted we can modify it in the enlargement proper.

Vignetting. The best arrangement for vignetting in enlarging is a piece of cardboard the size of the negative, with an opening cut out at the proper place and about the size of the portion of the negative to be vignetted. This is held near the lens and moved backward and forward between the latter and the screen, the opening showing larger as we near the lens and smaller as we recede from it. Very tasteful vignettes can be made in this way. A favorite method of the writer's is to use a sheet of bromide paper, preferably that with rough surface, and print on it a small vignette of a portion of a negative. These sheets being of a uniform size are then bound in book form, and make very attractive souvenirs. Variety can be added to the collection by printing some of the pictures through a mat fastened on the screen over the paper, when, of course, they are bounded by straight, sharp lines.

Composite Printing. Double printing in enlarging is not at all difficult. Assuming that test-strips have been made determining the proper exposure for each negative, I will briefly outline the process. Taking a landscape negative with clear sky in which we wish to print clouds, we first tack on the screen a sheet of paper the size of our bromide, and after properly adjusting and focusing it, trace with a pencil the outline of the sky-line. We then remove the foreground negative and, after tracing, cut out a mask conforming to the size and shape of the foreground, cutting away the sky. We now put in the box the sky negative, and readjust our sheet of paper until after proper focusing the desired portion of the sky occupies the portion reserved for it, leaving the thumb-tacks as a guide when we put our bromide on the screen. Now using the sheet of paper as a guide, place on the edges of the bromide paper two little pencil marks to show how far we shall shade the lower portion of the paper. Our mask being the size of the foreground negative, it is now only necessary to hold it at the proper distance from the lens to have its edge conform to the sky-line when enlarged. But this would leave a sharp line if held exactly at that point, so using the pencil marks on the margin as a guide, we slowly raise and lower the mask very slightly and just sufficient to cause an agreeable blending of the sky into nothing. The proper exposure given, we cap the lens, remove the paper and insert the foreground negative. Now we must again adjust our sheet of plain paper until the sky line marked on it coïncides with the sky-line on the screen, leaving thumb-tacks as usual. Registry being thus secured, we simply expose the foreground and develop the composite print.

Needless to say, our clouds must be lighted from the same general direction as the landscape. But if in the negative they are not so lighted it can be reversed in the holder and will then print properly. In almost all cloud printing the tendency is to give undue prominence to the clouds by printing the sky to too deep a tone. This, besides making the blending very noticeable at the horizon, results in unnatural effects and should be avoided.

If the sky portion of the landscape negative is thin, it might print slightly and spoil the effect of the clouds. This can be overcome by using a weaker light in enlarging. Where this is not desirable, a mask can be cut for the sky portion and used slightly while the foreground is being printed. By using it a very little during the first part of the exposure the tint will be overcome, while objects projecting above the horizon will be sufficiently printed. It will be found easier, no doubt, to print the landscape first and sky afterwards. But this does not result in good work. The landscape should invariably be printed after the sky portion.

Bolting Cloth. Bolting cloth enlargements were for a time very popular. Sometimes they were artistic. Then everyone began making them, too often from unsuitable negatives, and they fell into disrepute. This method of enlarging is, in fact, suitable for very few negatives, and only where broad effects of light and shade are desired. To cut up a spotty negative with a succession of lines does not necessarily give a broad effect in the picture. But for softening down heavy masses of shadows, and blending them harmoniously with masses of light or half light, the process is without an equal. The bolting cloth can be bought by the square yard of dealers in photographic supplies, and should be stretched evenly over a frame made of quarter- and half-inch wood, being tacked between the two strips. This frame can be easily adjusted to fit over the paper on the screen. By using the side, bringing the cloth within a quarter of an inch of the paper, the lines are more evident, which is not so objectionable for very large work. But for the softest effects, reverse the frame and use it at half an inch from the paper. In this way we get a soft diffusion of the lines and much greater general softness. It should never be used nearer than a quarter of an inch, as the lines then become too evident, and hence fail in the effect desired. The bolting cloth comes in three grades, fine medium and coarse. The medium is the best for general work. It should not, however, be used for sizes under 8x10. The interposition of the cloth requires about one-half additional exposure. Focusing, of course, must be done without the frame in place. The bolting cloth should only be used with paper which is to be toned to some color other than black, as there is something incongruous in its use with black tones. It looks best with softer tones and on *Royal Bromide* paper, or the English *Whatman Bromide*, already mentioned.

After-Treatment. The subsequent manipulations with bromide paper do not differ materially from those with negatives. The support being paper of course makes some difference and the fact that while in the negative we aim to get printing density and printing color only, in the positive we aim to please the eye, makes another. But generally speaking, it may be said that whatever we can do with the negative we can do with bromide paper, that is, in so far as the emulsion itself is concerned.

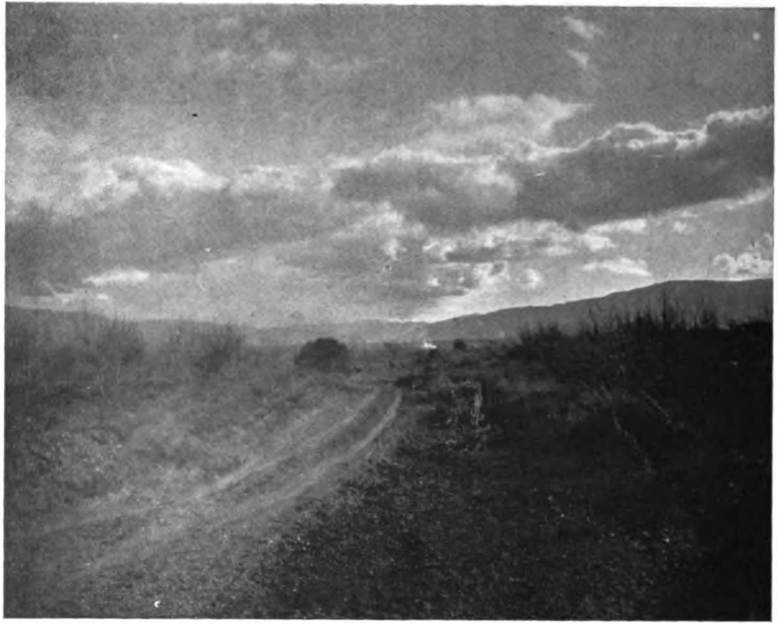
Reducing. The first operation to be taken up is the reduction of prints which are too dark. This can best be effected just after the prints come from the hypo. A few grains of red prussiate of potash are dissolved in a suitable quantity of water, the latter being barely tinged, not of a strong yellow color. If the print is too dense throughout, it can be immersed without previous washing in this solution. Reduction should take place gradually, and this is best accomplished with a weak reducer. If the tray be rocked gently the reduction will be quite uniform. If, however, only a portion of the print needs reduction, this can be effected by applying the ferricyanide solution locally with a brush or bit of absorbent cotton. Extreme care is needed in this operation. In this way unduly deep shadows can be softened, veiled high lights brightened, or almost any modification obtained which may be deemed desirable. When reduction is almost completed quickly rinse the print in running water and then wash thoroughly. If the print has been dried, it is only necessary to soak it for a few moments in a fresh fixing bath, when the ferricyanide can be applied as before.

Intensification. For the intensification of bromide prints quite a number of processes can be used. In fact, almost any of those which will result in the permanent intensification of negatives will give good results on bromide. Many of the toning methods hereinafter set forth are methods of intensification, but there are several which result in black tones, and it is of these that I will speak under this head.

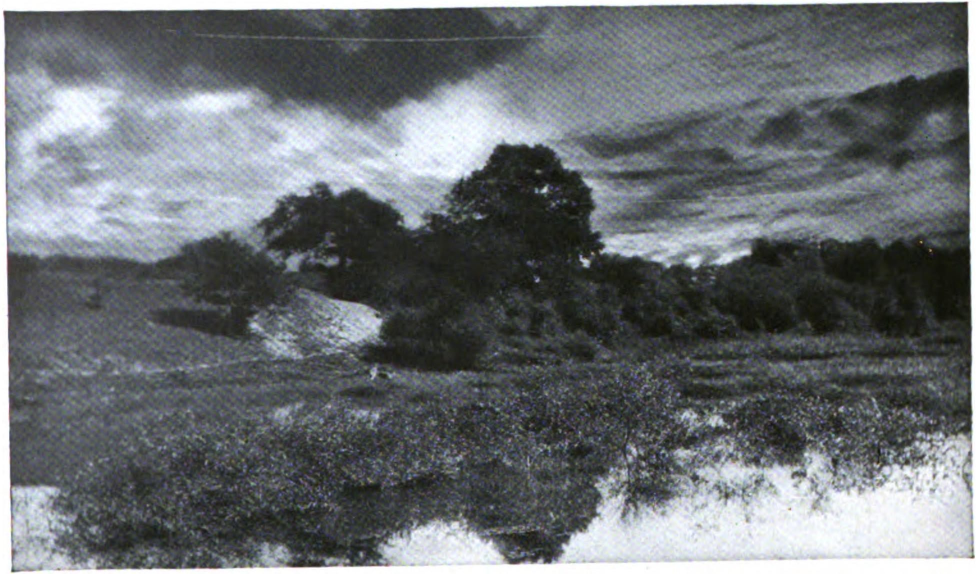
The simplest of these methods is mercuric intensification. Make up a stock solution as follows: Mercuric chloride, 60 grains; potassium bromide, 60 grains; water, 6 ounces.

After washing the print well to free it of hypo, immerse in this solution until thoroughly bleached. The longer the immersion up to a certain point, the greater is the subsequent intensification. When thoroughly bleached remove the paper and wash well for half an hour or more. At this point it may be well to use a solution as follows, as it prevents in a measure veiling of the high lights, which sometimes occurs. Common salt, 1 ounce; water, 16 ounces.

By immersing it in various other solutions after wash-



THE PASSING SHOWER
George C. Meeker
Philadelphia Salon, 1899



EVENING LANDSCAPE
F. C. Baker
Philadelphia Salon. 1899

ing, intensification in various shades of black results. Some of these are: Sulphite of soda, 10 per cent solution, giving a warm black tone; metabisulphite of potash, 3 per cent solution, giving a purple-black tone; chloride of gold, 1 grain to 1 ounce water, giving a blue-black tone; ammonia, weak solution, giving a warm black tone; and any ordinary developer, giving various shades of black.

After blackening in any of the above the print should be well washed, and then, if intensification is not sufficient, the same process can be used over again. The permanency of mercuric intensification is questionable, as I have had prints toned in this manner bleach badly after a few weeks' exposure to light and air. Again I have had them retain their original depth and brilliancy after two or three years' exposure on the wall of an ordinary living-room. But whatever be the cause of their occasional lack of permanency, the danger can be minimized by careful washing after fixing, after bleaching and after blackening. The methods of intensification given in the last number of THE PHOTO-MINIATURE: *Intensification and Reduction*, would be well worth a trial with bromide paper. For such experiments the use of spoilt prints is, of course, advised.

Intensification does more than intensify the bromide print. It gives a brilliancy and depth to the shadows which is frequently lacking in other than the very best and most carefully developed prints. It is, therefore, well to use the method freely, and whenever, in fact, the worker is not satisfied with the exact tone of his print after drying.

Toning.

The toning and intensification of bromide prints are so closely associated with each other by reason of the effects of each, that they should properly be considered together.

In addition to the above methods of modifying the final tones of the print, we have the very useful method of toning by the use of uranium nitrate. Other salts than those of uranium are used, but it is so very satisfactory in itself and gives such a wide range of tones and broad field for experiment that it will be sufficient to consider it separately.

Uranium Toning.

The tones obtainable on bromide paper by the use of uranium range from warm brown, through sepias, browns, red-browns, to reds, and then by the use of perchloride of iron or other iron salt we obtain greens, blue-greens, deep blues and bright blues, there being obtainable throughout a great number of intermediate tones. In making use of this process nearly every worker has a slightly different formula, but reduced to their rudiments they are practically the same. Equal or nearly equal proportions of uranium nitrate and ferricyanide of potash are dissolved in water and the solution is strongly acidulated. By varying the proportions of each, changing the strength of the whole or adding a little of this or that, full scope is given the experimenter. The results are prompt, and with care, reasonably certain.

Camera Club Formula. The formula published by the Camera Club of New York, and presumably in use there, is as follows: A. Uranium nitrate, 2 parts; glacial acetic acid, 2 parts; water, 120 parts. B. Potassium ferricyanide, 2 parts; water, 120 parts. C. Ammonium sulphocyanide, 6 parts; water, 120 parts.

For use take 1 part of A, 1 of B and 48 parts of water. Add C for red tones, the more of C the redder the tones. The use of C very much more diluted is recommended for the purpose of removing yellow staining of the high lights after toning.

Yellott's Formula. Never having had unqualified success with the use of sulphocyanide of ammonia in toning bromides, I omit it. A formula which I have used with satisfactory results is as follows: A. Uranium nitrate, 1 ounce; water, preferably distilled, 5½ ounces. B. Potassium ferricyanide, 1 ounce; water, preferably distilled, 5½ ounces.

For use, take in the following order: Water, 6 ounces; add of solution B, 2 drams; glacial acetic acid, 1 dram; add of solution A, 2 drams.

If ordinary acetic acid is used instead of the glacial, three or four times as much is required.

Solution A keeps indefinitely if put in a brown bottle, well corked and protected from the light. Solution B does not keep well under any circumstances, but is a handy solution to have in the work-room, needing only dilution for use in reducing negatives or prints.

Manipulation. While the uranium toning process can occasionally be used to save under-exposed prints, I do not so recommend it, as yellow staining of the high lights and bronzing of the shadows almost invariably result. It is far better to make the prints originally with the view to toning them. The most suitable print for toning by this process is one which has a good gradation of tones, but no very deep shadows. Therefore, what we require is a properly exposed but somewhat under-developed print. It will be found that prints on the rough bromide papers tone much more evenly and satisfactorily than those on the smooth papers, although on the latter certain tones are obtainable which are seldom had with the rough varieties.

The print should first be soaked in water, after which it is placed for a moment between blotters. It is then placed in a perfectly clean tray and flooded with the toning solution. Within a minute the change will begin, the various tones being in the order already given. The process is a rapid one, the red tones being reached within five minutes with the formula given. During toning the tray should be gently rocked. The moment the desired tone is reached the print should be immersed in a plentiful supply of water acidulated with a few drops of acetic acid. This checks the toning. After all the prints are toned they should be washed in running water, or several changes, until the slight yellow stain caused by the ferricyanide of potash disappears. Longer washing impairs the tone. If the yellow tinge in the high lights is decided and cannot be removed by ten minutes' washing, it is simply an indication that the wrong character of print has been used. It can sometimes be removed by a momentary immersion in a very weak solution of carbonate of soda. But if this solution is at all strong the color of the entire print will be discharged. After final rinsing, the prints are pressed between blotters for a moment and hung up to dry.

A variation of the red tones can be made after washing by immersing the print in a weak hypo bath containing a few drops of the red prussiate of potash solution. This seems to cut out the underlying blacks and leaves the reds brighter. The tone thus obtained very closely resembles the red-chalk of the carbon process.

Green and Blue Tones. For green and blue tones we use perchloride of iron crystals in solution. Other iron salts can be used, but this is the most satisfactory of all. The iron should not be used in a stronger solution than ten grains to the ounce of water. From that point it can go down to a tenth of a grain to the ounce. Between these points there is a wide range of effects. The first effect of the iron solution, which should immediately follow the uranium bath, is to change the reddish tones to green, then to blue-green and finally to a deep blue. By stopping the uranium toning at various stages a different grade of greens and blues can be obtained. By varying the strength of the iron solution, as stated, still other tones result, so that we cannot wonder that the greatest objection to the uranium and iron process is that no two people ever get the same results. Furthermore, the perchloride of iron, spoken of in the German and British literature on the subject, is quite different from that on the American market, and as a matter of course results will differ somewhat. With some tones of red and some strengths of the iron solution double toning will result, the half-tones and lighter tones taking a bluish tinge, while the reds change to brown. Local toning can also be indulged in more or less profitably. In fact, the results are so variable that it would be idle to pursue the subject further, since in uranium toning, if nowhere else, "every man is the architect of his own fortune."

It may, and frequently will, happen that our toned prints are not quite satisfactory. If so, make up a solution of carbonate of soda in water, about 1 part to 20, and immerse the print. The alkali immediately discharges the color. It will frequently also bleach the print. In this event the print should be washed and flooded with a developer of normal strength. It will then regain its original color and be ready for another attempt at toning. But inasmuch as the presence of the alkali in the paper or emulsion would interfere with proper toning, the print, after having been in the carbonate of soda, must be thoroughly washed, and it is advisable also to give it at least one bath in acidulated water. The carbonate of soda in somewhat stronger solution is also invaluable in cleaning fingers, trays, graduates, etc. Unless this be used the stains are very difficult to remove. Ammonia, carbonate of potash or, in fact, any of the alkalies used in photography will have the same action as the carbonate of soda.

Trimming, Mounting.

All the thin varieties of bromide paper curl badly in drying. If they are to be kept unmounted it is well to immerse them in water to which has been added a few drops of glycerine. This will ensure their lying flat after drying. A solution of 2 ounces of glycerine in 25 ounces of water is advised when it is desired to make bromides on heavy rough paper remain flat, after drying, for book illustration and similar purposes.

If one is trying to rush through a bromide print, it can be trimmed while wet by placing it on a sheet of stiff paper and cutting through both.

The paper will be found to cockle the mounts badly in drying. Aside from the glue mountant, formula for which accompanies the paper, I know no preventive except to mount the prints while dry. As the paper when wet stretches one way considerably, as much as a third of an inch on a ten- or twelve-inch length, provision must be made in trimming, especially if mounts with centers of a given size are used.

The paper being covered with an emulsion which in warm weather is very soft while wet, mounting is somewhat more difficult than with some of the other papers. My method is to mount not more than half a dozen at once, placing them face down, one on top of the other, on a glass or ferrotype plate, blotting off the surface water and spreading the paste over the top one in the usual way. I place this on the mount and then stretch over it smoothly a damp handkerchief or piece of very thin rubber cloth, rubbing the print down with my hands, seldom using the squeegee and then very lightly. By this method abrasion of the surface seldom results and air-bells are unknown. Owing to the strong contracting power of the paper in drying, the mounting paste must be used freely, especially at the edges of the print.

Apart from the methods of procedure here given, there are innumerable modifications covering every detail of contact printing and enlarging on bromide paper. Most of these have been given careful trial as published, but few have quite fulfilled the expectations they created. The methods and formulæ given are, for the most part, those employed by Mr. Osborne I. Yellott, whose notebooks have been of great assistance in the preparation of the monograph, and whose valuable help is here acknowledged with thanks.

BOOKS.

Bromide Paper. Instructions for Contact Printing and Enlarging. By Dr. E. A. Just. 3d English Edition. 156 pp. Illustrated. 75 cts.

Practical Enlarging. By John A. Hodges. (Eng.) 4th edition 1900. 138 pp. Illustrated. 50 cents. A useful rèsumè of various methods.

Manuals dealing with the manipulation of the various brands of paper may also be obtained, generally *gratis*, from the various manufacturers of bromide paper. The Eastman book is titled, "Permanent Bromide Papers;" the "Barnet Book" deals with Elliott's papers; and a booklet titled "Wellington Papers" treats of the Wellington & Ward papers. All these contain useful hints.

NOTES.

The following interesting particulars concerning photography in Japan are taken from an article titled "A Chat with a Japanese Dealer," published in *The Photographic Dealer* (London) for June. The dealer mentioned is Mr. Asanuma, of Tokio, now visiting Europe. When Mr. Asanuma established his business thirty years ago, there were only three photographers in Japan. Today they number several thousand, and the development of amateur photography has been marked by considerable energy and enterprise. The introduction of Thomas' collodion into Japan some eighteen years ago was the signal for a new and progressive movement as far as photography was concerned, and a year or two later Mr. Asanuma introduced Mawson & Swan's dry plates, which thereafter became very popular. There is now a dry plate factory in Tokio, managed by Mr. Asanuma's brother, who is said to have learned his business in American factories, "where he received several diplomas."

The duty on photographic goods entering Japan has been raised from 5 per cent to 25 per cent, and this will doubtless still further stimulate Japanese photographic industry. We learn that the "Premo," imported direct from America, has the largest sale of any camera in Japan. The Dallmeyer lens is the favorite objective, although latterly the Cooke and Goerz lenses are winning their way forward by progressive advertising. In dry plates and printing papers British manufacturers apparently hold the lead, and there seems to be a profitable field in this and other details for our American makers. The cinematograph is already popular in Japan, and every advance in color-photography is eagerly followed there because of the natural disposition of the Japanese to brightness and color in everything.

◆

Two English journals, *The Junior Photographer* and *The Practical Photographer*, edited by Percy Lund, will hereafter be published as one journal under the title *The Junior Photographer*. The chief features of *The Practical Photographer* will be retained, and the first number of

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the new series will be issued in August. (Percy Lund, Humphries & Co., Bradford, England.)

◆

Potassium boro-tartrate is recommended by an English worker as a restrainer in place of potassium bromide in negative development. No particulars of its advantages are given.

◆

"*Cosmos*," of the *British Journal of Photography*, is generally interesting in his "Jottings," although at times inclined to be caustic in his remarks. It would seem, from his latest effort, that he has become infected with the anti-American fever raging among English photographic journalists at present. We quote his comments on the American photographic press. "Some of the American photographic publications supply funny reading matter just now. It is all over pictorial photography. A few ladies and gentlemen in New York are industriously booming themselves and their work, which may best be described as of that kind which a professional photographer would consign to his waste tub, whilst the public and the common-sense critics would not have it at any price. These self-deluded, if well-meaning, people claim the leadership of pictorial photography in America, on the grounds of the unrecognizable smudginess of their work and the slobbery stuff, styled 'appreciations,' that is written about it. But Boston warmly disputes the claim of New York to take the lead in pictorial photography, and Chicago is equally emphatic on the same subject. There are already some half-dozen rival 'Salons' in the United States, and at Pittsburg, recently, a show of photographs was divided off into a 'Salon' and a mere 'Exhibition of Photographs!' Probably not one British photographer in a thousand sees the American publications or the photography of the very newest pictorial kind which they largely illustrate. It is best described as closely resembling the inscrutable nebulosities of landscape and portrait work which were shown here some five or six years ago. In the States it is called 'freak' photography. Of course, the disease in this country wrought its own cure, and we have long since passed the stage when the visitor to a photographic exhibition only too frequently found himself in a condition of despairing doubt as to what some of the productions on the walls were supposed to be, photographs or not. We know

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now where we are in these matters, and, when some of our American brethren begin to realize that a pictorial photograph is not necessarily an exceedingly bad one in every single respect in which camera work should excel, there will be a return to a saner state of things. Many of the recent illustrations in *Camera Notes*, the *Photo-Era*, the Chicago *Photo-Beacon's* Salon number, and the Pittsburg *Catalogue*, clearly show that the originals must be painfully poor things indeed, judged from any critical standpoint, artistic or photographic." For that little word "some" at the beginning of your "screed," accept our thanks, O venerable "Cosmos."

❧

The June number of *St. Veronica* (Calcutta) comes to us in a sage green cover, a page more ample than of old, and has a portrait of Mr. George Ewing, the editor, as frontispiece. The new dress is a distinct improvement, and we are glad to possess the portrait.

❧

Messrs. Burke and James, Chicago, have placed on the market a very useful outfit of supplementary lenses for amateur use, thus meeting a well-defined need to which attention was drawn in these pages a year ago. The set consists of four supplementary lenses, a ray-filter and a duplicator, thus giving the amateur with one lens of good quality the practical advantages of five different objectives. Full particulars may be had on application to Messrs. Burke & James.

❧

Writing in the London *Amateur Photographer*, upon the difficult detail of focusing dark interiors, Francis Fielding advises the use of a focusing eye-piece, with a screen fitted for aërial focusing, as vastly superior to the ordinary ground-glass screen, and a candle to focus upon in the dark corners of the view. We quote his description of the preparation of such a screen as likely to be of service to our readers.

"To make one, get a piece of the finest ground-glass, half a dozen microscopic slide cover-glasses, and half an ounce of Canada balsam. Thoroughly clean the ground-glass with soap and hot water, dry, and give it a rub with vaseline applied with a small piece of flannel, warm it before the fire, and rub again with a clean piece until the screen presents a semi-transparent surface. Now with a fine-pointed black lead make three small crosses

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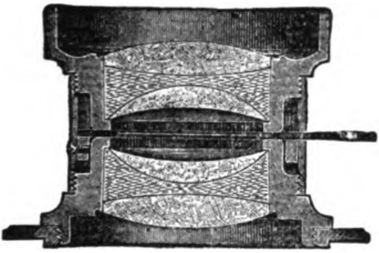

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on the screen—one in the top right-hand corner, one in the exact center, and one in the bottom left-hand corner. The use of these will be seen later. Next, on each of these crosses place a drop of Canada balsam, and then press a cover-glass on each. It will be seen that the ground glass is now transparent. If there is any balsam oozed out from under the cover-glass it can be cleaned off with turpentine when set, which will be about two days.

"Fix the camera up, and point it to a distant poster or any reading matter just too far away to be read with the naked eye. Focus this, and then apply your focusing eye-piece to the ground surface of the glass. The letters are enlarged certainly, but so is the grain on the ground-glass; but if we place the eye-piece over one of the clear places, and adjust it until we get the cross sharp, now move the camera until the reading comes over the cross, a slight turn of the screw will bring every letter as clear as the printing itself, and it is surprising how a slight turn of the screw will blur or sharpen the image. After focusing the cross, always keep the eye-piece adjusted or else mark it, so that it is ready without focusing, every time. Bear in mind for the image to be absolutely sharp, the cross and the image must be in focus at the same point; and negative so focused will stand enlarging more diameters than if focused in the ordinary way."

◆

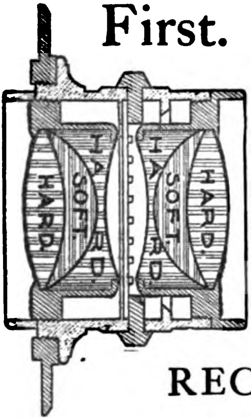
Photo-Formalin, specially put up for photographic use, is being introduced by Schering's Chemische Fabrikauf Actien, of Berlin. This comes in the form of a concentrated solution, and when diluted in the proportion of 1 part of formalin to 9 parts of water, it gives a hardener for negatives and films superior to alum. As a convenience for summer photography formalin is comparatively unknown among American photographers, this, we believe, being solely due to lack of enterprise on the part of Schering's agents in this country.

◆

In the June 21st issue of *Photography* (London) may be found a translation of Dr. Eder's recent monograph on "The Sensitometry of Photographic Plates," originally published in the November, 1899, number of *Sitzungsberichte der Kaiserl. Akademie der Wissenschaften in Wien.* The translation, by Mr. C. H. Bothamley, is somewhat condensed in form but, nevertheless, gives a fairly comprehensive review of the methods employed and conclusions presented by Dr. Eder.

TWO POINTS

First. Permanency



due to the correct position of the soft Jena glass, where outside influence cannot get at it

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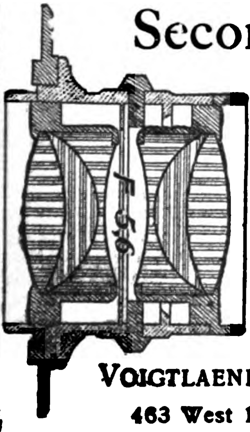

due to the large aperture and correct construction. Series II is the Ideal *Portrait, Group and High-speed Instantaneous Lens.*

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A very interesting patent is that recently issued to J. E. Thornton and C. F. S. Rothwell, Manchester, covering the manufacture of a photographic film for producing positives direct in the camera. Black paper, or paper coated with black or colored varnish, is coated with gelatino-bromide emulsion. This is exposed in the camera, developed, and fixed as usual, after which the picture is whitened by mercuric chloride or another suitable salt.

❧

A rather curious feature of our British exchanges at present is the large amount of advertising they carry announcing American cameras and specialties manufactured on this side of the Atlantic. We say "curious" because in many instances the British agents for American manufacturers are apparently able and willing to spend much larger sums in advertising American specialties abroad than our manufacturers are able to afford in the home markets. Looking over these advertisements, there can be no doubt that the American manufacturer of photographic goods is woefully lacking in enterprise when compared with his foreign agents. When will our American manufacturers awaken to the fact that advertising is the soul of business? And that the cultivation of the home market by a generous amount of legitimate advertising is more profitable than selling their output to foreign agents on a pitifully small margin of profit over cost of manufacture?

❧

The *Photographic Salon* (London) is announced to be held at the Dudley Gallery, Piccadilly, London, from September 21 to November 3. The last day on which pictures will be received is September 10. Entry forms and particulars may be obtained from Mr. Reginald Craigie, addressed in care of the Dudley Gallery.

❧

In a recent issue of *Photographische Mitteilungen*, Dr. E. Vogel has an interesting paper on sulphite of soda in which special stress is laid on the necessity of avoiding sulphite which has become oxidized by exposure to air, if precise results are sought in negative-making. This contention has been repeatedly urged by Mr. M. A. Seed, on this side of the Atlantic, and is undoubtedly a detail in manipulation which will repay scrupulous care. Dr. Vogel points out the special importance of pure sulphite in making up metol developers, otherwise the solution

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will take on a reddish color, and its efficiency be impaired. He suggests that this point offers a convenient test as to the quality of sodium sulphite.

◆

Mr. Thomas Manly, the inventor of *Ozotype*, the modified carbon process, by which carbon prints are made without transfer, actinometer, or safe-edge, announces the publication of a manual of instructions for the working of his process. Copies of this manual should reach this country before the end of August.

◆

According to a memoir published in an English newspaper, Dr. P. H. Emerson was born in Cuba in 1856, of American parentage. Taken to England when a boy, he was educated at Cambridge, and filled for some time the post of house physician at King's College Hospital, London. Abandoning the practice of medicine, he began in 1885 to issue the photographic pictures of life on the Norfolk Broads, which brought him fame. With Linley Sambourne, he was one of the founders of the London Camera Club, and in 1895 was awarded the Progress Medal of the Royal Photographic Society.

◆

The Paris Exposition.—The University of Paris has an exhibit in the Palace of Letters, Science, and Art, containing a number of reproductions of photographs of the moon and of the heavens, covering a wall space of 60 x 13 feet. The large photographs of the moon are presented to the public for the first time. They have been taken by Messrs. Loewy and Puiseaux with the large telescope of the observatory; the photographs are shown in small size in order to appreciate the fineness of detail obtained by the instrument, then a series of bromide enlargements is shown by which they are more clearly seen. One of the photographs is that obtained by taking two plates of the moon at ten and at twenty days after new moon; hese have been enlarged sixty times the surface and placed side by side, the result being an image of the whole hemisphere of the moon with a direction of light which brings out the relief and shows the details of the craters and mountainous region.

◆

The subjoined account of the foundation and conduct of the glass works at Jena, where the glass used

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in making modern lenses comes from, will doubtless interest many who have heard of "Jena glass" without comprehending the significance of the term. It is extracted from *Photography*, whose editor, in turn, extracted it from the catalogue of the German Section of the Paris Exposition:

The works were founded in 1884, having their origin in a laboratory established for the experimental fusion of glass for optical and other scientific purposes. The first laboratory experiments were made in conjunction with Professor Abbé in 1883 and 1884, and these having opened up favorable prospects of the production of optical glass possessing new and valuable properties, the undertaking was substantially subsidized by the Prussian Government. Thanks to this help, the preliminary experimental meltings were able to be repeated on a commercial scale, and the undertaking speedily became a financial success. With the lapse of time the manufactures were extended to include other glasses, not necessarily for scientific purposes, but possessing qualities which had hitherto been unattainable. For instance, a boro-silicate glass for thermometers was devised capable of resisting fusion to such an extent as to make it adapted for high temperature thermometers registering as high as 1,022° Fahr. (550 C.). Then, again, glasses for lamp chimneys and laboratory purposes, capable of resisting sudden changes of temperature to an extraordinary degree are now turned out in huge quantities. The lamp chimneys will stand sprinkling with cold water whilst on the flame, while the laboratory glass possesses great power also of resisting chemical actions. Special attention has been given, however, all along to optical glasses, of which over a hundred varieties are made. One of the latest introductions is a greatly improved annealing process to produce such glass as free as possible from internal tension. Altogether, the institution is a remarkable example of the Prussian method of state-aided enterprise. Viewed in the light of an investment only, it is hard to imagine a better use to which a government could put its funds than in the development of a huge, new, and profitable industry.

◆

A combined *toner, reducer and intensifier* has been introduced by the Haller-Kemper Company, Chicago. This is said to give a cherry-red tone to bromide prints, *Velox*, *Vinco* and *Kruxo*, etc., and may be used as an intensifier or reducer of negatives. The tube of

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material supplied makes 16 ounces of solution, which may be used repeatedly.

◆

Mr. B. J. Falk has just equipped his new studio, at the Waldorf-Astoria Hotel, New York, with apparatus for making portraits at night, by the electric light. The portraits we have seen made with the new apparatus are as good as anything Mr. Falk has made with the usual daylight equipment, which is a great deal to say about electric light portraiture. The system consists of an umbrella frame, about 4 feet in diameter, with a white silk roof. Around the inside of the frame are arranged 21 lamps of 100 c. p. each, with a larger lamp of 150 c. p. at the center. Five of these lamps suffice for focusing purposes, after which 12 lamps are used to get the lighting effect desired. When all is ready for the exposure the full force of light is switched on, and, by a special arrangement, doubled in power for the actual time of the exposure of the plate, giving a total of about 4,500 c. p. This permits of an exposure of two or three seconds, and gives a negative of remarkable softness and depth. We learn that the light has proved as efficient for small groups as for single portraits, and that Mr. Falk has been kept busy since the light was installed, with groups and sittings from the aristocratic crowds which throng the Astoria roof-garden during these summer evenings.

◆

According to the *British Journal of Photography*, professional photographers in the west of Scotland (Glasgow) are returning to the use of scenic backgrounds, highly-glazed printing papers, and other features characteristic of the "old-fashioned" portraiture. Some have adopted the old albumen paper, others have taken up the modern development papers, and carbon prints are being popularized. Evidently, the reaction is against the use of platinotype papers, cold blacktones, and the severely simple styles of backgrounds and accessories so popular of late years.

◆

Mellen's *Pocket Tripod Stay* is a capital contrivance for holding the tripod absolutely rigid on slippery pavements, polished floors, or in any position outdoors where it is necessary to place the tripod in awkward places with each leg at an uneven length. We have found it immensely useful in all home portraiture, relieving us of all

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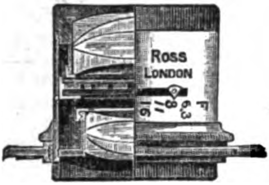

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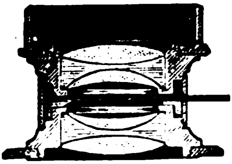

These deservedly popular lenses have already an immense sale. They are the

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worry as to whether the camera legs will slip during focusing or exposure. The *Stay* consists of three light steel rods working in a central socket, adjustable at any angle and at any desired length according to its position on the tripod. Each rod has a clamp at the free end and the three rods can be fixed in less time than it takes to describe it. The *Stay* folds up into pocket length and does not materially add to the weight of the amateur's impedimenta. It should prove invaluable to all owners of tripod cameras. (George E. Mellen, Times Building, Chicago.

◆

Our correspondence tells us that there are many amateurs who would like to possess a long-focus hand-camera, with its many advantages, but that the cost of these instruments is beyond the average amateur's purse. In the *Cycle Cartridge Solograph*, however, we have a thoroughly good camera of this class at an extremely moderate price. This instrument has an unusual length of bellows extension, reversible back, and may be used for plates or films at will, being fitted with an extra film attachment. The Scovill & Adams Co., 62 East Eleventh Street, New York, who manufacture the *Solograph*, have just issued a booklet showing its advantages. A copy of this booklet may be had for the asking.

◆

The Hammer Dry Plate Co., St. Louis, asks us to make known that their *Special Extra Fast Red Label* plate is more rapid than their well-known *Extra Rapid* plate. A consequence of this is that the *Red Label* plate should be placed in Class 1 in the Table of Comparative Plate speeds on page 72 of THE PHOTO-MINIATURE, No. 14: *Street Photography*, and the *Extra Rapid* plate should be placed in Class 1½.

We hear with pleasure that the *Red Label* plate, introduced last year, is among the most popular plates in the market for work requiring the utmost rapidity.

◆

The introduction of the new *Color Differentiating* (orthochromatic) plate by the Lovell Dry Plate Co., New Rochelle, N. Y., has given these popular plates a larger hold on public favor. As recently tested on a variety of color subjects, with and without a screen, the *C. D.* plates have given us unusually rich negatives, with pleasing separation in the color or luminosity values, and fine printing qualities. These plates and the *Lovell Extra*

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Rapid (ordinary) may now be had backed for nonhalation effects, etc. Concerning backed plates, we cannot do better than repeat Mr. E. W. Newcomb's forcibly expressed opinion that "the time to use backed plates is all the time." When once the photographer appreciates the improvement secured in a negative by the simple expedient of backing it, there can be no doubt but that backed plates will be universally employed. For this reason the Lovell backed plates are a step in the right direction and should have an early trial.

◆

An English firm (Levi & Co., 97 Hatton Garden, London, E. C.) announces a series of magnifying lenses for *Kodak* cameras. These enable one to make portraits and groups at distances of 3, 6, and 9 feet, and should prove a useful aid to *Kodak* workers. A more generally useful outfit, however, is the *Ideal Photo-Optical Outfit* recently introduced by Burke & James, Chicago, and announced in their new catalogue. Everybody possessing a hand-camera should inform themselves concerning the advantages of this outfit. Particulars may be obtained from Messrs. Burke & James.

◆

According to the *Amateur Photographer*, London: Fox Talbot, although a pioneer in several branches of photography, was scarcely the "inventor of photography," as over-enthusiastic admirers have sometimes called him. Still, Fox Talbot did one very great thing which the photographic "historians" appear to have overlooked; he was the discoverer of spectrum analysis (1834), in which field he was followed by Wheatstone, Brewster, and Stokes. Then came the elaborate treatise of Bunsen and Kirchoff. The position of Niepce as the inventor of photography appears incontrovertible, as he made paper photographs, negatives on glass, and photo-printing plates as far back as 1824. Thus, it is to Niepce we owe the alliance of the camera and the printing press.

◆

We have received from George E. Mellen, Times building, Chicago, a *Pocket View-Finder* with several novel and practically useful features. Reference to another page will show the construction and use of this finder more completely than a brief description can do. The finder may be used to good advantage whether one has a camera at hand or not, and is especially valuable

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By means of which over 100 DISTINCTLY DIFFERENT LENS-COMBINATIONS may be obtained, which can be applied to the Rectilinear or Anastigmat lens of any camera made, producing the following combinations:

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6 **ORTHOCHROMATIC RAY SCREENS,** as light, medium, and dense.

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3 **PROJECTION OBJECTIVES** for Bromide Enlargements.

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Photographic lenses of every description.

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for finding what will be included in the view when photographing dark interiors, flash-lights at night, or for panoramic work, in all of which details the ordinary finder is apt to disappoint. It is adjustable to all sizes of plates, and to any lens; is neatly finished in nickel, and fits the vest pocket.

❧

Monckhoven, of Ghent, Belgium, one of the oldest manufacturers of carbon-tissues, has recently introduced a new carbon tissue which is said to admit of enlarging direct on the paper without the use of the usual enlarged negative. We will place further particulars of this before our readers at the earliest possible moment.

❧

Messrs. Ross Ltd. write that their new series of *Symmetric Anastigmats* are meeting with considerable favor among hand-camera workers, by reason of their efficiency and moderate price. The new catalogue issued by Messrs. Ross Ltd., fully describes and illustrates these anastigmats, and may be had on application to the firm at 111 New Bond street, London, W.

❧

In a handy digest of information concerning pinhole photography published in *Photography* for July 5, the editor says: For exposure the same rules are followed as the ordinary *f*/- numbers, but as such calculations cannot well be made in the field it is well to prepare a list which can be consulted at a moment's notice. As *f*/64 is the smallest stop usually given on actinometers, it may be conveniently taken as a standard, if then one second is the correct exposure with *f*/64 for a given subject on a certain plate, the exposure would be twenty times as much with a $\frac{1}{50}$ inch pinhole at an extension of 6.5 in.; twenty-six times with pinhole $\frac{1}{44}$ inch, extension 7.4 in.; thirty-one times with pinhole $\frac{1}{40}$ inch, extension 9 in.; forty-four times with pinhole $\frac{1}{34}$ inch, extension 12.4 in.; fifty-four times with pinhole $\frac{1}{31}$ inch, extension 15.4 in.; and sixty-one times with pinhole $\frac{1}{28}$ inch, with extension 18.3 in.

❧

While these pages are in press the national association of American photographers is in convention at Milwaukee. The annual convention of British photographers has just closed at Newcastle-on-Tyne, in the north of England. The interesting features of these

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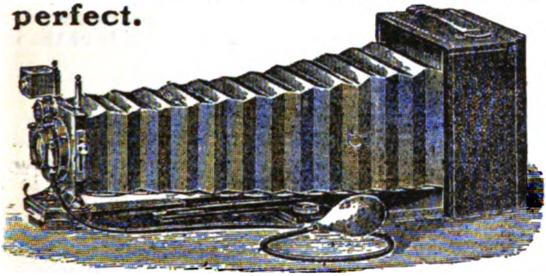

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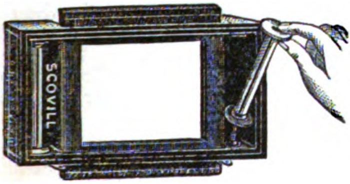

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gatherings will be reported in the August number of The Photo-Miniature.

◆

Readers desiring to secure a copy of the Keiley-Stieglitz monograph on the glycerine method of developing platinotypes should send their orders without further delay. Less than a dozen copies remain on hand, and the monograph will not be reprinted. A description of the work appears on the inside of the front cover of the magazine.

◆

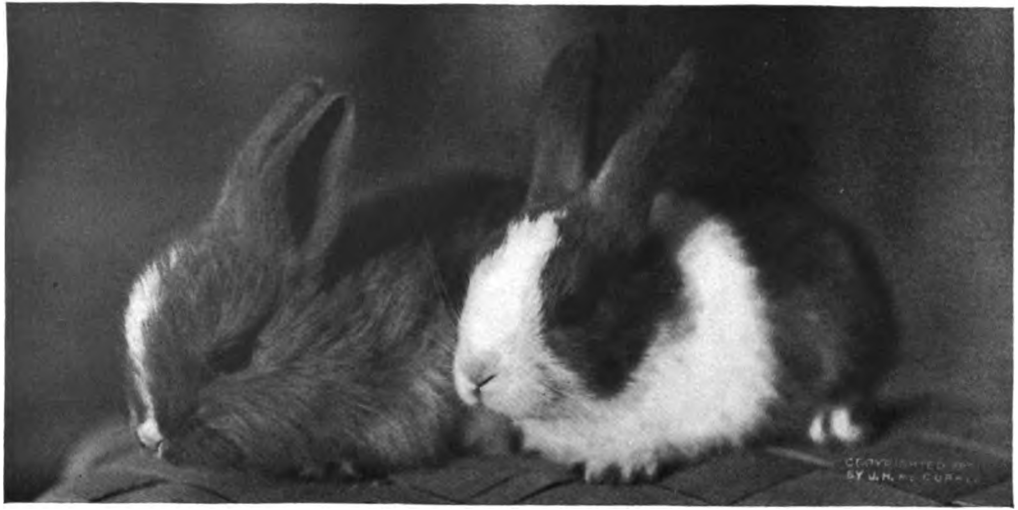
The G. Cramer Dry Plate Company asks us to give the following announcement as wide publicity as possible. We do so with pleasure, knowing that every photographer, from Puerto Rico to Manila, will rejoice in the good news:

"All dry plates work best when fresh. *Cramer* plates will hereafter be protected with a label on the bottom of each box of plates, limiting the time within which the plates should be used for the best results. We consider this protection necessary to guard our patrons against plates which have deteriorated by age.

"Do not accept *Cramer Crown* and *Banner* brands prior to emulsion No. 13180; or Cramer *Isochromatic* prior to emulsion No. 3916.

"We feel that this long-delayed action is in the right direction, and will be appreciated by our friends and the trade generally."

This is, indeed, a big step in the right direction, and must give further impetus to the well-deserved popularity of the Cramer plate.



PLAYMATES

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THE PHOTO-MINIATURE

A Magazine of Photographic Information

EDITED BY JOHN A. TENNANT

Vol. II AUGUST, 1900 No. 17

THE CARBON PROCESS.

As soon as the novice in photography has mastered the rudiments of negative-making, he turns his attention to the various processes available for the obtaining of prints from his negatives. Naturally, the methods first attempted are those most commonly practiced or advertised at the time. The method must be simple; our novice has learned just sufficient of photography to make him afraid of its chemistry. He questions a friendly dealer or consults a text-book and, as the result, the "blue" print or silver printing methods are usually those with which the amateur first becomes familiar. As his experience broadens, he learns that there are several methods of making "blue" prints, grouped under the generic name of Iron Printing Processes, because they are based on the light-sensitiveness of salts of iron. Similarly, he learns that there are many different ways of making silver prints, such as albumen, collodio-chloride, gelatino-chloride, bromide, and plain paper processes, all included under Silver Printing Processes, because the picture-image they give is composed chiefly of silver in one form or another. Sooner or later the "blue" print wearies by its monotony of color; the silver print is found to be somewhat complicated in its manipulation, and its permanence a matter of speculation rather than certainty.

Looking further afield, the platinum printing processes excite his interest and admiration. In their use he finds so much satisfaction and pleasure that here the ambition of the average photographer rests, content to investigate no further. Platinotypy offers the practical advantages of simplicity in manipulation and beauty of result; there is abundant variety of surface texture and color or tone; and the platinum print is incontestably permanent. Printing in platinum from many negatives of different qualities, or from negatives embracing widely separated classes of subjects, the photographer gradually but surely accumulates a certain measure of discontent. Sometimes the range of color or the detail-giving capacity of his platinum print seems somewhat limited; at another time it is apparent that, after all, the finest platinum print lacks (for certain subjects) the richness of effect or delicacy of tone possessed by the abandoned silver print. What is needed is a process combining the qualities of the "blue," the silver, and the platinum methods: in other words, a photographic printing method reasonably simple in manipulation and inexpensive in the materials required; which will give the full scale of tones from light to dark, as far as the negative presents them; which affords a generous variety in surface finish or texture, in color effects and character of support for the picture-image, as the subject requires; and which will give permanent prints. Is there such a process? To the best of my knowledge and belief, the specifications given simply and plainly describe the carbon process—to which this little book is wholly devoted.

The Process Described. Described in the orthodox way, the carbon process is a printing method which, by the usual "exposure" and "development," gives a print in which the picture-image consists of permanent pigment, such as carbon, embedded in a thin film or "tissue" of insoluble gelatine. In its first state carbon paper is a film or "tissue" of gelatine with which is incorporated pigment or coloring matter, coated on a sheet of paper intended merely to support the film during exposure. By immersion in a solution of potassium bichromate the "tissue" is "sensitized," i. e., acquires the property of becoming insoluble upon exposure to light. When exposed to light under a negative, in the usual way, the tissue is rendered insoluble in proportion to the amount of light which has acted upon it at different parts of the negative image. In "development" the exposed tissue is washed with water. This causes the soluble portions of the pigmented film (i. e., those portions more or less protected from light by the density of the negative) to dissolve and clear away. By this we get a positive image in pigmented gelatine. The color of the image varies according to the pigment incorporated with the gelatine forming the "tissue." The permanency of the print depends upon the permanence of the pigment employed in making the tissue. The exposed film or "tissue" being transferred (by a simple operation) before "development" to a second (temporary or final) support, permits of any desired modification in the surface finish or texture of the print, and the choice of a variety of supports, such as different kinds of paper, glass, opal, wood, leather, metals, or other similar surfaces.

Its Origin. Although comparatively unknown to American photographers of today, the carbon process is no new thing in photography. More than forty years ago, while the photograph was yet a source of wonder to the world, the amateurs of that day lamented the instability of the popular silver print. They wanted the photograph to be not merely "a thing of beauty," but also "a joy for ever." Therefore they set about the invention of a process which would give prints equalling the silver print in delicacy and beauty of image and, at the same time, possessing the desirable quality of permanency. The iron printing processes were recognized as unsuitable for general use; platinum printing was unknown, save in a crude and experimental way and, in those early years, there were no old processes which could be re-invented and exploited as new. In these circumstances the malcontents who flourished between 1853 and 1868 turned their inventive genius along new paths, wfth the happy result that we have the carbon process.

Evolution. The evolution of this carbon printing process and its variations is too long a story to be retold here, but there are a few facts of which the reader may desire to be informed. Briefly, then, the starting point was Mungo Ponton's discovery (1839) that paper soaked in a solution of potassium bichromate was sensitive to light. In 1853, Fox Talbot published the fact that gelatine impregnated with potassium bichromate became insoluble on exposure to light. Poitevin, who is generally regarded as the father of the carbon process, put these two facts together in a practical way and, in 1855, published the first carbon process proper, i. e., the process of coating a sheet of paper with bichromated gelatine containing pigment or coloring matter, exposing this to light under a negative, and washing the exposed sheet with water to dissolve the soluble portions of the coating, thus obtaining a positive print in color or pigment embedded in insoluble gelatine. This was a big step in advance, but the process was yet far from perfect in that it gave prints devoid of half-tones. The reasons for this will be apparent as the reader grasps the elementary principles of exposure set forth in the following pages. Many remedies and improvements were suggested, patented, and abandoned until, in 1864, Swan published the process substantially as it is used today. The publication of Swan's process, with some few improvements in details, brought carbon printing prominently forward. During the years 1867–1876 the process was extensively introduced in America and eagerly taken up here and in Europe.

Carbon in America. Whether the photographers of that time failed to grasp the essential points of the process, or whether inexperience and climatic conditions interfered with its successful working, I cannot tell; but the introduction of the process in this country failed utterly. After a year or two it was abandoned with general disappointment, and the professional worker returned to the use of albumenized paper with renewed zeal. Fortunately the process had been taken up on a large scale by several important firms in Europe, such as Braun (of Dornach), Monckhoven (of Ghent), and the Autotype Company (of London), and by them employed in the making of fine reproductions of famous paintings and works of art. In this way the priceless treasures of the European art galleries, the works of the masters, etc., have been brought before art students and picture lovers all over the world. Incidentally, but of importance here, this enterprise has demonstrated the possibilities of the carbon process in a most attractive way. Following this demonstration, there has been awakened, in America especially, a new interest in and appreciation of the carbon process, and there are unmistakable signs that, in this revival of interest among amateur and professional workers of the better sort, carbon printing will at last attain the popularity and honor it so well deserves. With this introduction to the subject, let us get down to practical details, and learn for ourselves the uses and advantages of carbon printing.

Is the Process Simple? I have said that the carbon process is simple in its manipulations. This is a statement which, at a first glance, will be hotly disputed by not a few workers. Let us look into it. Necessarily the simplicity of any process depends upon the thoroughness of our knowledge of it, and in another sense, upon the character of the different operations required to complete it. We must know and understand the principles on which it is based, and the why and wherefore of its various stages. From my own experience and conversations with many carbon printers, expert and otherwise, I am convinced that the difficulties which some have found in working the process have arisen either from a lack of intelligent grasp of the principles on which the process rests, or from the difficulties which naturally attend the manipulation of a gelatine film under varying conditions of weather, locality, and season of the year. Of this I am sure, that if the reader will once master the sensitizing and drying of the tissue, and the change effected by exposure, he can, with reasonable care, avoid both the trouble and failures commonly experienced.

Comparison. By contrasting silver and carbon printing, the simplicity of the latter is clearly apparent. In making a silver print we have paper coated with an extremely thin film of albumen and ammonium chloride with a little alcohol. This is sensitized by floating the coated paper on a neutral solution of silver nitrate. When dry, the sensitized paper is "fumed" by submitting it to the fumes of ammonia to render it more rapid and to give it other qualities. It is then exposed under a negative, and we get a picture-image in darkened silver chloride of uncertain chemical composition. This image is unstable and not agreeable in color. It must now be washed several times to clear away the "free" silver, and is then "toned" or given an agreeable color by immersing the print in gold or platinum solutions which must be nicely balanced in their composition. This toned image must now be "fixed" by immersion in a solution of hyposulphite of soda, and finally well washed until every trace of "hypo" has been removed. Here, obviously, are many subtle processes of chemistry and many chances of failure. In making a carbon print we take paper coated with a comparatively thick film of pigmented gelatine, and sensitize it by immersion in a solution of bichromate of potash. When dry, the sensitive paper is exposed under a negative, prints more quickly than silver paper, and we get an image of insoluble gelatine, surrounded by a mass of more or less soluble gelatine. The exposed print is now wetted in water and pressed into contact with a fresh piece of paper The two pieces (in contact) are placed in warm water; the backing of the gelatine film is removed, and the soluble portions of the exposed film (now supported by the paper to which it was transferred by contact and pressure) are washed away with water. This leaves the picture-image in insoluble gelatine. The print is immersed in an alum solution to clear the whites, washed, and dried. Here are no chemical processes, but only simple mechanical operations. The principal difficulties which may arise must, we see, spring from the handling of the gelatine film which, as we know, is peculiarly sensitive to atmospheric conditions.

The Fundamental Principle. The principle on which the carbon process is based is simple enough, and its practical applications should not present unreasonable difficulties. First, let me state the principle, viz: that gelatine combined with bichromate of potassium becomes insoluble upon exposure to light, in proportion to the amount of light which has acted upon it. Other bichromate salts may replace the bichromate of potassium, but we will consider this as the one most commonly used. The fact that in carbon printing the sensitive film or tissue of bichromated gelatine contains a pigment or coloring matter does not effect the application of the principle. Now let us apply this principle to the exposure of a piece of carbon paper or "tissue" as it is often called. A clear grasp of this is essential, so I will use a sketch to illustrate the effect of light-action on the tissue. (Fig. 1.)

Light-action. This diagram represents a greatly magnified section of a negative in contact with a piece of carbon tissue, the gelatine surface of the tissue being magnified out of all proportion for the purpose of illustration. A B C is the negative, of which A represents clear glass, B half-tones, and C high lights, which last I have treated as being not quite opaque to the printing light. D represents the paper support of the gelatine coating or tissue. E, F, and G are portions of the gelatine coating lying immediately under A, B, and C respectively. The light penetrates the portion A to the maximum extent, hence we have the maximum amount of light-action in the gelatine at E. But *it is important to notice* that while this light-action is at the maximum at the surface of the tissue at E, it gradually dies out or weakens in its passage through the film, as I have tried to indicate in the drawing. At F the light-action does not extend as far as in E, nor is it as great at the surface lying next to the negative B as it was in E. At G the light-action is barely appreciable either at the surface or in the film. H, therefore, represents the portion of the gelatine coating which has not been acted upon at all by the light.

It will now be seen that the whole of the immediate surface below the negative has been rendered more or less insoluble by the action of the light, although there are portions underlying this surface which would be soluble if the water could get at them. To effect this the tissue, after exposure, is immersed in cold water until it becomes pliable and is then squeegeed firmly, gelatine surface down, to a support of prepared paper, opal, celluloid or glass, to which support it adheres firmly. This "transfer" effected, the two supports, with the exposed film between them, all closely adhering, are immersed in warm water. The water quickly penetrates the paper backing D and begins to dissolve the gelatine H. After this has gone on for a few moments the backing D is stripped off, leaving the gelatine coating firmly attached to its new support. And now reverting to Fig. 1 and imagining that the negative A B C is our new support and that the paper D has been removed, it will be seen that the uninsolated or unexposed gelatine H is on the surface, when by laving with warm water it rapidly dissolves away until we reach the insolated or more or less exposed gelatine E, F, and G, thus leaving the densest coloring in our shadows, a less dense coating in the half-tones and a very slight coating in the high lights—all exactly as it should be in the print.

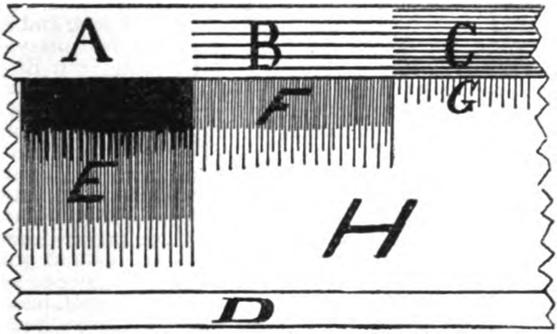

Fig. 1.

Common sense tells us that while slightly exposed or insolated gelatine may be insoluble in water at one temperature, it is readily soluble in water at a higher temperature. Therefore, if our print is too dense, dark, or heavy, when the action of the water at a given temperature seems to have ceased, we simply use warmer water, when it will attack the portions E, F, and G, and wash away those portions of each which have received equivalent amounts of light-action. A close study of Fig. 1 will show this more clearly than would several pages of text, and will also explain much of what may in the ensuing account appear at first somewhat vague and difficult to understand. In fact, a clear grasp of this paragraph is tantamount to an eventual full understanding of the whole carbon process.

Carbon Supplies. Carbon tissues may be obtained in a variety of colors, from most large dealers. They are of such uniformly good quality, and so reasonable in price, that it would be folly for the individual worker to attempt the task of preparing his own. Those who desire to experiment in this direction, however, will find formulæ and instructions in Wall's *Carbon Printing*, to which they are referred.

"Tissues." The tissues generally used here and in England are those made by the Autotype Company and Elliott & Son, both English firms, and those of Braun & Co. These are readily obtainable in New York or London. Monckhoven's tissues can possibly be obtained in London, but are not found in the American market. There is no appreciable difference between these standard makes either in quality or manipulation. The colors listed are as follows: Black, engraving or platinotype black, warm black; dark blue, light blue, marine blue; purple, Lambertype purple, purple-violet, violet-brown or photo purple; gray; photo-brown, standard brown, Barnet brown, Braun brown (or bistre No. 3); warm sepia, sepia, bistre sepia; Mansell red, terra-cotta, red chalk; sea-green, dark green, light green, and black-brown. I give the full list because all these colors, as made by three manufacturers, differ slightly in the color-effects they yield, and I want to show the wonderful variety of color-effects open to the carbon printer. Some of these tissues may be had in convenient cut sizes, but all are obtainable in rolls, usually 2½ feet wide and 12 feet in length. As the tissue keeps indefinitely when unsensitized, the roll is the best and most economical way in which to buy it when once the process is taken up for constant use. Thus, a roll will give nine dozen 5 x 8-inch pieces, at a cost of thirty cents per dozen sheets. In cut sizes a dozen pieces 5 x 8 inches costs about fifty cents. In England *sensitized* tissues, in cut sizes, are readily obtainable. This is an immense convenience not available to the American worker because of the present limited demand here.

"Transfer Paper." "Transfer paper," listed as "single" or "double," is also necessary, as we will see hereafter. This can be bought from dealers who stock carbon tissue and supplies, for

BUNNIES
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VALLEY OF SAN LUIS, CALIFORNIA

Oliver Lippincott

twenty or twenty-five cents per dozen sheets 5 x 8 inches. When bought in rolls this cuts up at a cost of twelve or fifteen cents per dozen sheets of the same size. It is here seen that the rough cost of carbon prints, to wit: tissue and transfer paper is about equivalent to Willis & Clements' platinotype paper if bought in cut sizes, but is little more than the cost of development silver papers, such as bromide or Velox, if bought in rolls and cut to size as required. The loss from spoiled prints is very small indeed, after the first experiments, on account of the great latitude of exposure in carbon printing, so that the process is not an expensive one.

Supports. In addition to tissue and transfer paper some form of "temporary support" will be needed. This is used to support the exposed film in development where the "double transfer" method is used, as will be plain hereafter. The "temporary support" may be a piece of glass, or opal, or a prepared paper called "flexible support"—simply paper coated with insoluble gelatine and shellac, so that it is impervious to water. The surface texture of the temporary support determines the surface finish of the print. Thus to get matt-surface prints ground opal or grained zinc is employed as the support; for an ordinary glazed surface finish the "flexible support," waxed, is used. Celluloid is also useful for this purpose. In any event, the temporary support must be a little larger all around than the piece of tissue in use. As it is usable repeatedly the support is comparatively inexpensive.

Tools. Apart from these things we need a thermometer, an old-style or "scraper" squeegee (two are better than one), a few ounces of potassium bichromate and three pieces of rubberized cloth or waterproof fabric, a little larger in size than the prints we propose to make. A supply of waxing preparation, and possibly a bottle of plain collodion, complete the outfit. Trays for sensitizing, printing frames, etc. are not here included, as forming part of the normal equipment of the amateur. The purpose of these essentials will be evident as we go along, and the reader can then determine for himself what he needs. If the necessary supplies cannot be obtained from the local dealer, they may be had from E. & H. T. Anthony & Co. and G. Gennert, of New York. The first named firm is the agent for the Autotype Co.'s goods; the second for the carbon tissues of Elliott & Son. Braun & Co. also have a branch house in New York. The reader will do well to get the lists of carbon supplies published by these firms, and keep them at hand for reference as needed in working from these pages.

Storing the Tissue. After being cut, the tissue should be stored away under pressure except when intended for immediate use. Unless so stored it has a tendency to curl up around the edges and is unmanageable in the printing-frame. It should not be stored where it will become damp or mould. With reasonable care the unsensitized tissue will keep in good condition for years.

Résumé of the Process. Now, at the risk of wearying by repetition, I will again summarize the operations for making a carbon print. The tissue is first cut to the exact size of the negatives from which prints are to be made; it is then sensitized and, after drying, stored away until required for use. In use it is exposed under a negative, immersed in water with a temporary support (or a piece of final support), squeegeed into absolute contact with this new support and placed under pressure. This transfer of the film to the new support being effected, the tissue, with a support on both sides of the film, is immersed in warm water. In this the original support of the film loosens and is removed, and the picture is developed by laving the film with water. Development completed, the print, now on the "temporary support" (or final support if it is to be a single transfer print), is cleared in an alum bath, and dried. If the print was transferred to a "temporary" support, it is again transferred after development to the "final support"—which may be paper, wood, metal, glass, leather, etc.—and after drying is stripped from the temporary support, which completes it. It is here seen that the only unfamiliar operations are the sensitizing and the "transfers," and these, with the other operations, are really very much simpler than the description reads.

If the tissue is bought in cut sizes, of course there is no cutting to size to do. If bought in rolls a piece of zinc not less than the width of the roll will be found most useful, as the stiff, gelatinized paper curls in a pesky fashion when handled. Two edges of the sheet of zinc should be accurately squared and preferably marked off in inches on these two edges. With this a T square of proper size is used and the cutting done with a sharp knife, a shoemaker's knife being good for the purpose. With these articles, and weights of some kind to keep the tissue from rolling up, no trouble will be found in cutting it accurately to any desired sizes. Accurate cutting is necessary, as will be found when we come to the operation of printing.

In cutting or handling the tissue it is well to wear cotton gloves to protect it from finger-marks. If the tissue is brittle and difficult to handle, place it for a few hours in a damp place or hold it for a few moments over the vapor of boiling water. It should afterwards, of course, be dried out before storing away. The color of the tissue should be marked on the back of each piece, as most of them would otherwise be indistinguishable.

The Sensitizing Solution. I have said that the operation of sensitizing the tissue is simplicity itself. So it is, but if we wish to do the best possible work we should adopt a method and formula in the first place most nearly suited to the conditions under which we ordinarily work. While carbon printing is an all-the-year-round process when proper precautions are employed in its working, it is nevertheless a fact that the careless worker will run much less risk in working it during the fall and winter months than he will in spring and summer. In these latter seasons, more especially in this country, it requires unremitting care and ceaseless attention to details, and unless the worker intends to give it these he should put off his experiments until the winter.

The first question in sensitizing is, as to the strength and constituents of the solution. This depends upon a number of factors, first, the season; second, climatic conditions; third, character of negatives ordinarily used, and fourth, the character of results desired. In spring and summer, or in damp, moist climates such as we have in our southern coast states, the tissue has a tendency to become insoluble in drying, owing to the heat and moisture in the atmosphere. In this case it is necessary to add a small amount of alkali, preferably carbonate of ammonia, to counteract this tendency. As it is not possible to use sufficient alkali to entirely counteract this effect without giving rise to other evils, two additional precautious may be adopted, first the addition of alcohol to the sensitizing bath, which aids quick drying and thus prevents insolubility, and second, the use of less sensitizer in the bath. The use of sulphuric ether, as advised later, will also be found most helpful.

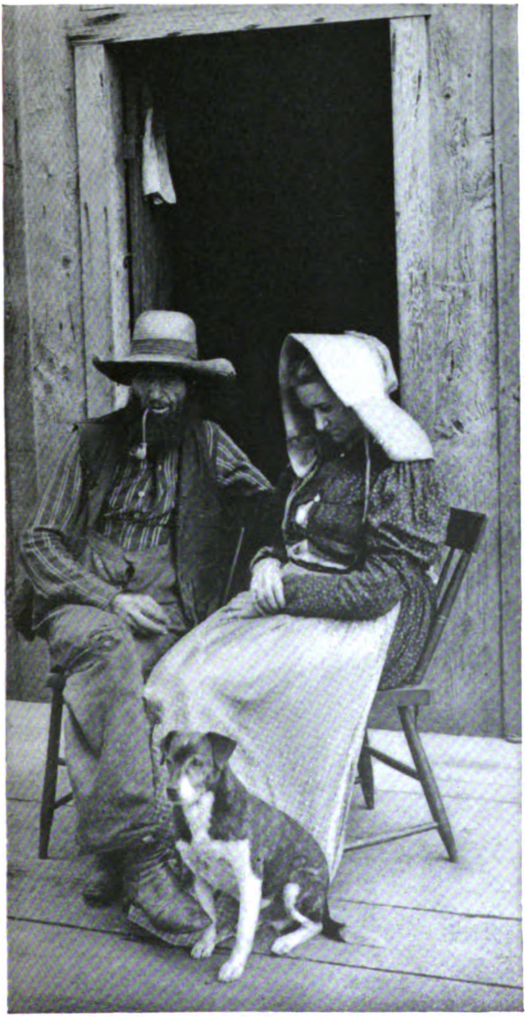
If one's negatives are unduly dense and strong in contrasts it will be seen that anything which will give the effect of more generally uniform exposure will be of advantage. By the use of more sensitizer in the bath the tissue has the tendency to become insoluble without exposure, this tendency being analagous to sunning down to decrease contrasts in ordinary printing. Therefore with such negatives in general use we can well afford to increase the strength of our bath. On the contrary, if our negatives are thin and flat, and we desire the utmost contrasts in our prints, it is advisable to reverse this plan and use a very weak bath. If, therefore, we are to adopt a certain sensitizing formula we should be governed by the conditions under which we are to work.

The formula which I have used during the past summer with results altogether pleasing is as follows: water, 1 quart; bichromate of potash, ½ ounce; carbonate of ammonia, 20 grains.

My winter formula retains the carbonate of ammonia as it facilitates development at all seasons, and increases the bichromate of potash to one ounce to the quart of water. As will be seen, this is approximately a one-and-a-half per cent solution for summer use, and a three per cent solution for winter use. Some writers advocate the use of a six or seven per cent bath for general use, but under no conditions should the amount of bichromate of potash exceed seven per cent. On the other hand if difficulty be experienced in getting proper contrasts with the negatives in use, the bath may be as weak as one quarter of one per cent but I would not advise the use of a weaker solution than one per cent.

The amount of carbonate of ammonia can be varied according to conditions existing when making up the bath, and does not materially alter the sensitiveness of the tissue. In dry, cool weather as little as one-half grain to the ounce of bichromate solution may be used, but if it is at all damp it is well to use more, but never go beyond five grains to the ounce. Wall advises for the sensitizing bath: Distilled water, 20 ounces; potassium bichromate, 1 ounce; liq. ammonia, .880 (stronger ammonia water), 5 drops. Here also the quantity of bichromate should be reduced in summer practice. In England liquor ammonia is apparently used in preference to the carbonate. There is no difference in effect, the essential requirement being an alkali to facilitate development by preserving the solubility of the tissue. The amount of ammonia added, therefore, should vary according to the strength of the bichromate bath, as the larger the amount of bichromate used, the greater is the tendency of tissue to become insoluble.

Alcohol, as I have pointed out, is sometimes added to the sensitizing solution to assist in quickly drying the tissue. Hence the amount to be added to the bath varies with the atmospheric or other local conditions. Thus in cool weather we may add alcohol to two per cent of the bulk of solution, and from this proportion up to twenty per cent in extremely warm, damp weather.



BLIND

W. S. Clow

WAITING FOR WORK

Chas. F. Inston

A formula for sensitizing tissue which has especial advantages for warm, moist weather is as follows: Water, 32 ounces; potassium bichromate, 2 ounces; liquor ammonia .880, 12 minims. Now add 1 ounce of sulphuric ether to ½ ounce of alcohol and add the mixture to the sensitizing solution. This gives a quick drying tissue and one readily soluble in development.

Modifications. From these notes the reader should be able to adopt a formula suited to his own conditions. In inland localities the first formula given may be taken as suitable for an ordinary negative. In the southern and coast states the formula with sulphuric ether will be found more useful, and the quantity of alcohol and ammonia may be increased as needed. The conditions, even in America alone, are too varied to give a single formula adapted to different localities.

Bölte recommends the addition of one grain, and Duchochois the addition of five grains, of salicylic acid to each ounce of the sensitizing solution, to prevent reticulation of the film during development. It is claimed that this addition makes the tissue, so prepared, keep better. The addition of glycerine has also been advised to prevent the paper from from becoming too brittle after drying. The proportions advised are from one to five minims per ounce of sensitizer, but the advantage is doubtful. Waterhouse says that liquor ammonia is preferable to the carbonate as less liable to deteriorate in warm, moist weather. The sensitizing solution should always be protected from light.

Now a word or two about modifying the sensitizing bath. Every grain of bichromate has its effect on the sensitiveness of the tissue. As we will learn later, the picture-image does not print out, and the progress of printing must be gauged by an actinometer of one form or another. Hence if we find the time that it takes for tissue of one degree of sensitiveness to become printed, it follows that it will take a different length of time if we use a more sensitive or less sensitive tissue. By constantly changing the strength of our bath we, therefore, constantly run the risk of loss in printing. Consequently it is best at all times to work with a sensitizing bath of a given strength. When it is varied for the winter, make the change once and for all until the following spring. Personally, I only change the strength at all in winter in order to render printing a less tiresome operation than it would be with the weak sensitizing bath, and I make due allowances for increase in the speed of the tissue. This holds principally as to the proportion of bichromate, the alcohol, ammonia, and other additions being varied more freely from time to time as conditions may require.

In making up the sensitizing bath the chemicals are suspended in a piece of muslin in a receptacle containing the proper quantity of water. They will then speedily dissolve without leaving any sediment. It is well to make up a sufficient quantity to fill a tray of the desired size to the depth of at least one inch, as trouble may otherwise be experienced in keeping the entire sheet of tissue under the surface. The bath can be used several times, but had best be filtered both before and after use, as loose particles of gelatine are apt to be left in it after use, and these soon spoil a bath. Some workers recommend that the bath be made up fresh every time, others say it can be used for months. I prefer to use it three or four times, never keeping it more than two weeks in summer, and then make up fresh solution.

Sensitizing. For sensitizing we need a deep agate-ware, zinc, or porcelain tray such as is used in negative development, and preferably one or two sizes larger than the pieces of tissue to be sensitized. Into this the sensitzing solution is poured until we have a depth of one inch — not less. The temperature of the solution is important. It should be used at a temperature of between 50° and 65°; never lower than 50°, nor higher than 65°. If lower, reticulation of the film may be caused; if higher the gelatine film may melt and run. In winter there will be no difficulty in keeping the bath at the proper temperature. In summer the tray containing the sensitizing solution should be set within a larger tray containing cracked ice, or preferably a freezing mixture of salt and ice. It is not well to put ice in the tray with the sensitizer.

The sensitizing of tissue is most conveniently done at night, so that the tissue will be dry and ready for use the following morning. To sensitize, the tissue, cut to the proper size, is thrust into the solution and completely immersed. A soft brush or sponge is now passed over its face and back to remove air bubbles, and it is allowed to soak for three minutes. This time of immersion applies to the first and last sensitizing formulæ given. With Wall's formula thirty seconds are given as the time for immersion in summer, and forty-five seconds in winter. This is quite at variance with American practice, but the main requirement is that the time of immersion should be uniform, whether one, two, or three seconds be adopted. In my own practice I use a clock when sensitizing and, after seeing that all air bubbles are removed from the first sheet immersed, at the end of one minute place a second sheet of tissue in the tray, and at the end of two minutes a third sheet. At the end of three minutes the first sheet is removed, and a fourth sheet is immersed. In this way a dozen pieces of tissue can be sensitized in about twenty minutes, and the operation is not tedious.

The Bichromate Disease. Before leaving the subject of sensitizing it may be well to note that bichromate of potash is extremely poisonous with some persons when absorbed into the system through the skin. It is therefore unsafe for any person having abrasions of the skin of the hands to put their hands into it, and in such cases rubber gloves or finger-stalls should be used. In fact, if much carbon printing is to be done, it will be safer for the reader to use such and take no chances. But the average amateur runs little risk in handling the solutions, as his work is likely to be rather limited. In the event of the poison being absorbed and producing ulceration of the fingers, Bölte recommends the following treatment: "Sulphite of calcium (two pills of an eighth of a grain daily for one week) and phenic acid in syrup (a tablespoonful morning and evening also for one week), and alternating these two for about six to ten months." A better plan is to put oneself into the hands of a physician skilled in the treatment of skin diseases, and inform him fully of the cause of the trouble he is dealing with. For my own part I have worked the carbon process at frequent intervals for more than fifteen years, and have yet to experience the slightest trouble in this direction. With other people, however, I have known the disease to manifest itself at the first attempt. In such cases, of course, the individual remedy is obvious, viz: let carbon printing alone as a forbidden thing.

Drying the Tissue. As quickly as the sensitized sheets are withdrawn from the bath, one at a time, they are placed face down on a clean and well-polished ferrotype plate or sheet of talced glass, and squeezed into close contact with the plate. In summer this plate should be made quite cold with ice before use. The sheets are then set aside to dry in darkness or non-actinic light. (With the new *Daylight tissue*, which is coated on a non-actinic support, the sensitized tissue can be squeegeed onto an ebonite, ferrotype, or non-actinic glass plate and dried in daylight, as in the draught of an open window. This tissue, however, is little used in America.) The ferrotype plate is not essential to the drying of the tissue. Some workers draw the tissue slowly from the sensitizing bath, passing it over a glass rod to take away surplus solution from the face of the tissue. It is then laid face down on a sheet of glass and the surplus solution removed from the back of the tissue with the squeegee. A strip of wood is now placed along one edge and the tissue is hung up by clips to dry. Another method is to bend the tissue, after sensitizing, over a piece of card bent in the form of an inverted U. The first method advised is, however, the best and safest, as protecting the surface of the tissue from dust during drying, and enabling it to dry flat. Tissue so dried strips from the ferrotype plate with a smooth surface which will easily come into close contact with the negative during printing.

There is another point in drying tissue in contact with an impervious material, which is not an unimportant one as affecting the working qualities of the tissue itself. The evaporation takes place from one side only, that is, through the paper support. The longer carbon tissue remains moist, the less soluble it becomes. Now, that portion which is in contact with the glass, the one that forms the picture, of course remains moist the longest, and therefore may be expected to prove less soluble than that nearest the paper, the part that has to be washed away in the development. That is precisely the best condition for tissue to be in, because it will hold the delicate tints of the high lights better than if it has a very soluble outer layer, which often happens when the tissue is dried in the usual way, particularly if it has been dried too quickly and used soon afterwards.

Under favorable climatic conditions, to wit, dry, moderate weather, the tissue will dry spontaneously in the proper length of time, which is from four to seven hours. But in damp weather some precautions must be adopted. The most usual course is to use a specially constructed drying-box. This is made so as to admit air but exclude light. In this box is placed a quantity of dry calcium chloride. If the chloride of calcium becomes damp through continued absorption of moisture, as it inevitably will, it must be dried out on a tin shovel in an oven or over a stove. The box should be of a size which will conveniently contain half a dozen or more ferrotype plates with adhering tissue, the plates being kept at a proper distance from each other to admit of a free circulation of air between them. This box should be kept in a dry room. If necessary to produce a current of air, as will be determined if the tissue dries too slowly, this can be done by following the suggestions set out in Fig. 2. But usually an ordinary living-room in which a fire has been burning during the day will be found a good place in which to dry tissue at night. In summer there is usually an upstairs room over the kitchen which is dry in any weather. Under normal conditions, tissue left in such a room over night will be found dry in the morning. If the room is apt to be light in the morning, it is well to strip the tissue from the ferrotype plates after three or four hours of partial drying in such a room and place the sheets on edge in a light-tight box containing dry calcium chloride. This plan is far better than trying to dry the tissue in the dark-room as, unless unusually well constructed, the dark-room is not a suitable place for this purpose. The sensitive tissue should never be exposed to noxious gases of any kind while drying or afterward.

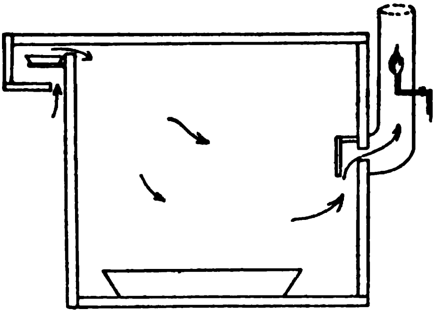


Fig. 2.

If the tissue dries in less than four hours it is apt to be too insensitive for satisfactory use. If it takes longer than seven hours to dry, the gelatine is apt to become insoluble and the transfer will be very difficult to effect. In such a case, moreover, the prints will almost invariably have the appearance of over-exposure.

Storing Sensitized Tissue. After thorough drying, the tissue is either left in the drying box or can be stored in black paper envelopes or in a box with a tight-fitting lid, such as is used for storing unsensitized tissue. It is most important that after being sensitized the tissue be protected from both light and moisture

After being sensitized the tissue rapidly gains in sensitiveness; i. e., in insolubility, and if kept too long will become wholly insoluble. This can be obviated to a great extent by keeping it in a drying box with calcium chloride, or in tin tubes with the same. It is also obviated to some extent by the use of salicylic acid in the sensitizing bath, as already recommended. But inasmuch as the sensitiveness is constantly increasing, it is well, for reasons already gone into, to make it a habit to use it always as near as possible at the same age. Sixteen hours is the minimum at which the writer has ever used it successfully, and ten days the maximum. It is generally conceded to be at its best three days after sensitizing, but can safely be used on the second, third, or fourth days. In very hot, moist weather it will hardly be usable after five or six days. A good test to find out whether or not the tissue is too old for use is to place a piece of it without previous exposure in warm water, gradually raising the temperature. If it does not dissolve at 110° or 120° Fahr. it is not suitable for printing and should be thrown away as useless.

Exposure or Printing. In carbon printing the image is not visible. Were our printing light constant this would be a matter of but little moment; but inasmuch as the strength of daylight varies so much from day to day, and from hour to hour, it becomes necessary to have some method of judging the intensity of the light when about to print. This is ordinarily done by means of an actinometer. The speed of carbon tissue, sensitized with the first formula and kept as directed, is considerably greater than that of the ordinary printing-out papers, such as *Solio*, *Albuma*, etc. In fact, it will be fully printed in the time that it takes the same negative to print to light-proof depth on one of these papers. By light-proof I mean a proof in which the details in the high lights are barely visible, or in which the shadows are considerably weaker than they are to be in the toned and finished print. Beyond this description it is a matter of opinion, and after that of experience. Some workers expose a piece of printing-out paper under the negative until it prints to the required depth, timing it with a time-piece, then exposing the tissue to a similar light for the same length of time.

A better plan is to expose the tissue under a negative and at the same time a strip of printing-out paper under another of about the same density, then take in the former when the latter has printed to the proper depth. If there is any doubt as to the relative densities of two negatives, a strip of printing-out paper under each will soon determine the question. This is an excellent plan where little work is being done, and one does not care to go to the expense of purchasing an actinometer.

Actinometer. A simple form of actinometer is that known as the Johnson Actinograph, which retails for a dollar. An actinometer of the same kind can be easily constructed from an ordinary pill-box. See Fig. 3. To make this actinometer slits are cut in the top of the box, as indicated. Through the slits is run a strip of printing-out paper, an exit for it being made at the side of the box, as indicated in the diagram. The paper is exposed to direct sunlight for sixty seconds. It is then taken indoors and the color to which it has tinted matched with water-colors on the top of the box. To use it we pull forward a fresh section of the paper and expose it to the light, this time either sunlight or diffused. When it has reached the tint painted on the box we call it one tint, and pull forward another section, calling this in turn two tints, and so on.

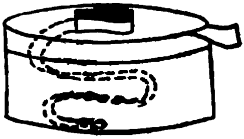


Fig. 3.

The method of using it is as follows: Having an hour or so to spare on a bright, sunshiny day, take a pile of negatives, the actinometer, and a lot of slips of printing-out papers. Place a slip of the paper under each of several negatives in the printing frame, choosing representative sections of the negatives, and expose to direct sunlight simultaneously with the actinometer. Move the slip of paper in the actinometer as it is tinted, and from time to time examine each of the slips under the negatives. When one slip seems to have printed to light-proof depth, mark in pencil on one corner of the negative the number of times the paper in the actinometer has printed to the tint-depth, thus designating it as a one tint, two tint, or three tint negative as the case may be. When all are tested and marked they are ready for printing on carbon tissue at any time or in any light without further testing. In so doing several negative with tissue are placed in the printing light simultaneously with the actinometer and, when the latter has printed one tint, the one tint negative is taken in; when the actinometer has printed to two tints the two tint negative is taken in and so on. In order to meet the contingency of very thin negatives, which frequently print in less time than it takes the paper in the actinometer to print to one full tint, it is well to make a second actinometer of the same kind, this time matching the tint on paper exposed only for 15 seconds to sunlight. With this actinometer the tints are referred to as quarter-tints, and are so marked on the negative.

A good type of the automatic tint-registering actinome- is *Wynne's Print Meter*. Particulars of the construction or a meter of this class are given on page 334 of THE PHOTO-MINIATURE, No 7: *Platinotype Processes*. The objection to actinometers of this class is that there is great difficulty in telling which is the highest readable number, the imagination frequently coming into play where the eyesight fails.

But it is not well to test a great number of negatives and find their tint numbers at first. It is better to test one or two accurately and then test the test, for it may easily happen that the worker's idea of a light proof is wrong, or that his tissue is so sensitized that a much lighter or deeper proof would be required. Hence, if upon development of the first few sheets of tissue all are found over-printed, it is a pretty fair indication that the light proof adopted as a standard was too dark; if they are under-printed it is an indication that the proof was too light. The remedy is to adopt a darker or lighter proof, as the case may be, and test the negatives anew, as well as make all future tests accordingly. After having made such preliminary tests and found the tint numbers of a dozen or two negatives, it will be quite easy to say, by merely looking at a negative, whether it is to be marked one tint, two tints, three tints, or ten tints.

The Safe Edge. In all printing with carbon tissue it is necessary to have an edge of the tissue protected from the printing light, and hence left in a soluble condition. This is called the safe edge, and without it the gelatine is apt to stick to the tissue backing on the edges more tenaciously than to the transfer paper. This safe edge can be a mask of thin yellow paper, a line of black varnish around the edge of the negative, or the rebate of the printing frame. A perfectly opaque mask may cause trouble, especially with improperly kept or over-printed tissue. But under normal conditions such a mask is reasonably safe.

Avoid Dampness. Carbon tissue should never be printed in damp weather if it can be avoided. If it must be so printed, use a rubber printing-pad in the frame to protect the tissue from dampness so far as possible, and transfer it immediately after printing to a tin tube or storage box containing calcium chloride. If the tissue sticks to the negative in the printing frame, the face of the negative should be lightly rubbed with French chalk and dusted off. This precaution should be invariably taken in hot, moist weather.

In using a negative very strong in contrasts, good results can frequently be obtained by exposing the tissue to strong light for a few seconds before putting it in the printing-frame. This must be done carefully.

Latitude in Printing. Fortunately there is a vast amount of latitude in carbon printing. I do not know that it has ever been accurately determined, but I have made two identical prints from the same negative exposed once for three minutes in a given light, and again six minutes in the same light. This was an experiment, and all factors were kept constant. As a matter of course, the prints were not developed in water of the same temperatures, but the point is that the one was not under-exposed and the other was not over-exposed so badly that there was any risk of losing the prints. But, notwithstanding the latitude which this and other experiments would indicate, it can be stated as an unvarying rule that the nearer right the exposure the greater the chances of getting a perfect print.

If it happens that the worker has comparatively few either unduly dense or unduly flat or thin negatives, he can oftimes get good results by simply using the tissue at different ages. Thus from very flat, thin negatives good results can usually be had from tissue only one day old, or even less, while from hard, dense negatives, soft prints can be had if the tissue be used after having been sensitized for five or six days. But it should be borne in mind that tissue one day old is not nearly so sensitive as it is at a later period, and allowance in printing must be made accordingly.

Continuing Action of Light. A curious property possessed by carbon tissue must be mentioned here. After the exposed tissue is taken from the printing frame and put away to await development, the action of light continues. Thus, if a print is kept for six or eight hours after a correct exposure, it will develop with all the appearances of over-exposure. For this reason, where we know that the correct exposure has been given, it is advisable to develop the print as soon as possible after removing it from the printing frame. If any great length of time must intervene between exposure and development, therefore, the print should be stored in an air-tight tube or box containing calcium chloride. A certain amount of dampness seems to accelerate this continuing action of light. Duchochois advises that if the exposed tissue is washed and sponged after exposure, and then thoroughly dried, this continuing action does not take place.

It is obvious that this continuing action may, under certain circumstances, prove advantageous. Thus, where under-exposure of the print is known or suspected, it can be compensated for by keeping the tissue in an ordinary (not air-tight or excessively dry) box or drawer for a few hours, or, where many prints are desired from a negative in dull weather, we can purposely under-expose each piece of tissue (thus saving time in exposure) and let the prints rest in darkness until the continuing action has been sufficient to give a perfect print on development. The length of this supplementary exposure must, of course, be determined by a trial development.

The Transfer.

We now come to the interesting operation of transferring the picture-image, and it is necessary here to determine whether we will use the "single transfer" or the "double transfer" method. This point is said to be one of the difficulties of the carbon process; let us thoroughly understand it. We saw, when studying Fig. 1, the necessity of developing the picture image from the under or back side of the film, i. e., that next to the paper support on which it is coated. It was plain, then, that development of the image from the face of the film would give us merely the lights and shadows of the picture, without half-tone. By transferring the exposed film to a new support, we are enabled to get at the back or under side of it, where the penetration of light was most feeble. In this way we can develop the image and get the full range of tones from highest light to deepest shadow, the delicate half-tones being held or retained by the hard crust of the face of the film, which received the strongest impact of light during exposure. Here we see the necessity for a transfer of the image, and this was the essential feature of Swan's improvement which made the carbon process practical and of real value for everyday use.

Single Transfer.

It is obvious that, if we wet the exposed carbon tissue and bring it, face down, into contact with a piece of paper or other prepared support, strip off the original paper backing of the tissue, and develop the image from the back of the film thus exposed, the picture will be reversed with regard to right and left on its new support. This is the characteristic feature of what is called the single transfer method. The picture so obtained is not in any sense defective or incomplete, except that it is reversed. For many subjects this reversal is of little or no importance; hence the single transfer method is largely used for pictorial work and even in portraiture. But where things must be represented as they are, as in an interior of a room, a topographical view, or a portrait of a lady showing the wedding ring in its proper place, the single transfer is not enough. We must again transfer the image to another and "final support," by which things are put into their proper places. This second transfer is a simple operation when necessary, but where much carbon printing is to be done, the extra trouble of it is obviated by using a reversed negative in the first place. Reversed negatives made in the camera, or by stripping and reversing the film, or by the use of a thin film instead of a plate are here spoken of.

Double Transfer. When an ordinary negative is used and a "double transfer" carbon is required, the exposed print is first transferred to a "temporary support," developed, cleared in alum solution, and washed. It is now transferred by being brought into contact with a piece of "final support" or "double transfer" paper, or any other desired support, squeegeed, and set aside to dry. When dry, the temporary support is easily stripped away, and the picture remains on the final support. Double transfer is really very simple, hence the worker need not hesitate to employ it whenever desirable, although the single transfer method is simpler in that it involves less trouble.

Working Single Transfer. With these preliminaries we will now take up the practice of the single transfer method, as the simplest for the beginner, and that most generally used. By this method we can make prints on paper, opal, glass, etc., as may be desired. A specially prepared paper known as "single transfer" paper is commonly employed. This can be bought in rolls or cut sizes, and in several varieties of thickness and color, such as thin or thick heavy hand-made paper, smooth or rough in finish, and heavy cream-tinted drawing paper. If a special paper or tint is desired for special effects, such paper can be prepared for use as follows: Take 1 ounce of good gelatine, soak in 1 pint of water for several hours, and finally dissolve by bringing the water in a water bath almost to the boiling point; then dissolve 20 grains of chrome alum in 1 ounce of warm water, and add this drop by drop to the gelatine solution while the latter is still hot, stirring briskly while adding it to prevent precipitation of the gelatine. Coat the paper as thinly and evenly as possible with this solution, and if the paper is quite rough give it a second or third coat. The best gelatine for the purpose is Nelson's or Heinrich's, which can be bought through the stock-houses. The paper should be coated in large sheets and cut to the required size as needed.

All single transfer papers, whether bought or prepared, should be cut to sizes a trifle larger than the carbon tissue, never smaller, as in such a case one of the edges may fall within the "safe edge" of the tissue and allow the backing to carry off a part of the image.

Transferring to Paper.

In making the transfer the printed tissue is placed face down in a tray of cold water, 50° to 65° Fahr., and at the same time a sheet of the transfer paper is placed in the same or an adjoining tray, care being taken to remove all air-bubbles from both. In from thirty to sixty seconds the tissue will be found to flatten out, and finally will begin to turn up at its edges, film inward. When it begins to curl in this way, it is brought face to face with the limp piece of transfer paper or other support, drawn out upon a squeegee board or zinc plate, and the two papers, with the film between them, are squeegeed into absolute contact, being covered with a piece of rubber cloth. A scraper squeegee must be used for this. It is essential that all water be expelled between the two pieces of paper, and that the contact of the surfaces shall be absolute, without air bells, etc. The two closely adhering sheets are then placed between blotters and put aside under evenly distributed pressure. After all the prints awaiting development are transferred in this manner, and placed in a pile with blotters between, they are left for from twenty minutes to an hour or more, according to the pressure upon them, after which they are ready for development. The purpose of placing them under pressure is to ensure even adherence of the tissue to the transfer paper. With thin, smooth transfer paper this may be effected in ten minutes, but with the heavy rough papers an hour may be better. In using the rough papers, moreover, it will be well to soak the transfer paper itself for a half hour or so in cold water before making the transfer, afterward placing the adhering sheets under very heavy pressure. One test of the sufficiency of the time the prints are under pressure is to note whether the back of the transfer paper is stained yellow by the bichromate of potash in the gelatine film. If so, it is safe to proceed with development. On the other hand, long-continued pressure can do no harm unless the tissue backing and transfer paper are allowed to become dry. They will not become so for several hours when placed between blotters in the manner described.

Transferring to a Rigid Support. If the print is to be transferred to matt opal or glass, instead of paper for its support, these should be selected plates, free from flaws of any kind, absolutely clean and free from grease, and coated a few hours previous to use with a solution of albumen. This is prepared by beating the whites of three eggs to a froth, and adding 1 ounce of water with 5 drops of liquor ammonia, giving a thin, viscid solution. Plates coated with this should be dried free from all dust, and have an imperceptibly fine film which, acting as a substratum, holds the bichromated film firmly during the development of the exposed tissue. Plates so prepared are handled just as described for the manipulation of single transfer paper, and matt opal plates give a fine matt surface picture of great delicacy. The carbons on opal seen in art stores are usually produced in this way, and the opal support is in many respects the most advantageous form of support with which the novice can make his first carbon prints.

Development. The development of the print is the most interesting part of the whole carbon process. After the prints have been under pressure for a sufficient length of time they are thrown separately into a large tray containing a plentiful supply of water at a temperature of from 90° to 100° Fahr. They should be rocked for a few moments and all air-bubbles removed. Finally it will be noticed that the gelatine around the margins has begun to dissolve and is oozing out over the edge of the transfer paper. Let this go on for a few moments more and then remove one of the prints to another tray containing water at a temperature of from 100° to 110° Fahr. This is the developing tray, and the water should be kept as nearly as possible at the temperature stated. This can be effected by placing the tray, a tin or zinc one, over a gas or an oil stove with flame adjusted to the proper height. After being in this warmer water for a moment the print is ready for stripping. Take one corner of the tissue backing and, with the other hand holding the print under the surface of the water, gently strip off the backing. If it comes off readily it is an evidence of correct or under-exposure, but if it seems disinclined to strip this is an evidence of over-exposure or partial insolubility of the tissue, and it should be allowed to remain longer in the warmer water. If the printing was correct the backing will leave behind it on the new support a thick, gelatinous mass in which at first no detail can be seen. By gently rocking the tray this mass will dissolve away and gradually the image will appear. Now lift the tissue and carefully place it, face up, on a slab of glass inclined at an angle to the bath, and gently lave the image with the warm water by means of a glass, cup, or large spoon. Gradually the details will brighten up and in a minute or so the image will be fully developed. As soon as the print is developed a trifle farther (a little lighter) than it is to be when dried, since it darkens upon drying, it should be removed to a tray of cold water to stop development.

Under-exposed Prints. In one batch of prints we are apt to meet with both under- and over-exposure. In the former case the backing strips off readily and the first flow of water over the print carries off the most of the gelatine over the high lights. Another dash of water would probably leave the high lights bare. In such a case the print should be immediately removed to cooler water, say at 80° or 90° Fahr. Here it can be gently rocked and may eventually be saved. Reference to Fig. 1 and what was said on the theory of carbon printing will explain the reason for this fully. In case of under-exposure, even slight, the print must be handled most carefully and developed mainly by rocking, finally laving it with quite cool water to clear up the details and placing in very cold water to stop further development. If under-exposure is suspected the stripping and development should be done in as cool water as possible from the start, say 80° or 85° Fahr., because of the greater solubility of the tissue.

Over-Exposure. But if the print is found to be over-exposed, which is known by the uniformly dark or heavy appearance of the lights and shadows, the opposite treatment is required. For slight over-exposure no treatment is better than continued soaking in water at about 110° Fahr., occasionally laving it in the manner stated. But if it does not respond to this treatment the temperature may be raised to 120°, or even 130° Fahr., and the print developed in water at that temperature. If after a half hour's soaking in water at this temperature the print is still too dark, some other method must be adopted. The one which I have found most satisfactory in such cases is to add from a teaspoonful to a tablespoonful of ordinary salt to the quart of developing water and allow the print to soak in this solution for half an hour or so, afterward going on with development in warm water. This seems to have no bad effect on the character of the print, and will result in saving a great many. Some writers recommend the addition of a few drops of liquid ammonia to the developing water in case of over-exposure, others say a few grains of carbonate of soda or sulphocyanide of ammonia. The trouble with these is that a small quantity does little or no good, while a large quantity simply ruins the character of the print. Their use will also in double transfer ruin the flexible temporary support. Warren recommends soaking the print for half an hour in an acidified five per cent solution of ammonium persulphate, and then continuing development. I have found this method thoroughly satisfactory.

The great danger in forcing the development of an over-exposed print is in causing small air-bubbles by the use of water at too high a temperature, abrasions of the film by carelessly pouring on hot water, or rotting the film by the use of water too strongly alkaline. Patience, moderately hot water, and a little salt are, when used together, the best remedy I know of for over-exposures.

It is not well to use the same developing water for more than one print, as little particles of gelatine form in the water and are apt to attach themselves to prints afterwards developed in the same water. It is almost impossible to remove them.

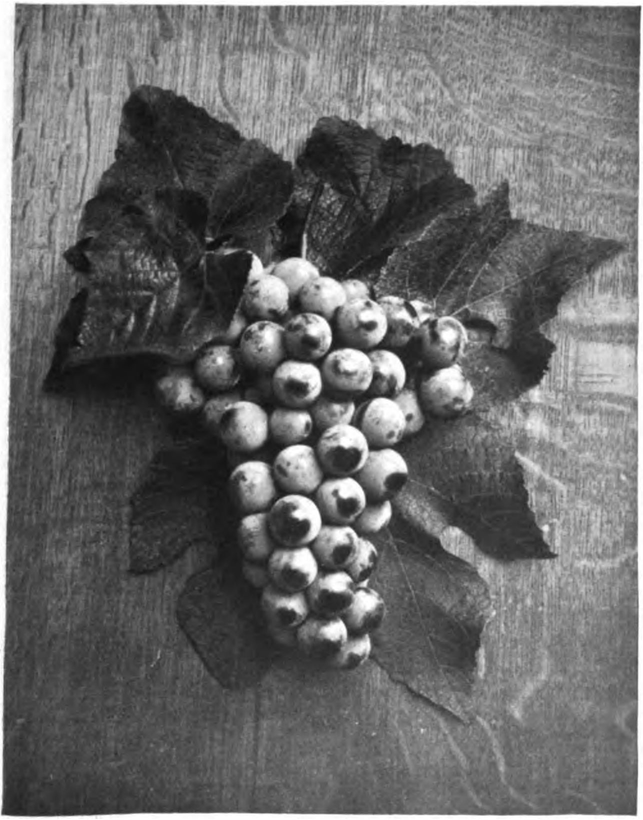
Control in Development.

In development heavy shadows can be lightened by properly directing a thin stream or jet of very hot water, or skies can be saved in the print by developing the foreground with hot water, locally applied with a cup or spoon, finally bringing the sky down to the proper tone by finishing up in cooler water. In fact, there are few prints which are not better for individual control of this kind in development. It is possible also in cases of over-exposed prints to reduce shadows or high lights by the light application of the finger or a brush, or by the local application of sulphocyanide of ammonia or carbonate of soda to the part to be reduced. More extensive brush work can be indulged in by advocates of that system where particularly artistic effects are desired, but neither brush nor finger is advised except in cases of over-exposure, as the gelatine film is ordinarily very delicate and easily injured. It should not be touched with the fingers, nor should two prints be allowed to come in contact in any of the solutions. All local work, of whatever character, should be done during the earlier stages of development in order that the after and general development may obliterate, as far as possible, any defects in the preliminary modifications.

Fixing or Clearing. The purpose of the fixing or clearing bath is twofold, first to harden the gelatine film, and second to eliminate every trace of the bichromate of potash which might remain in the film or paper after development. The bath is a simple five per cent solution of powdered alum in water. If it makes up turbid add a few drops of sulphuric acid. This bath must be filtered before use and may be used repeatedly. The prints remain in it for from ten minutes to an hour, the former when thin paper is used, the latter when using the heavy rough papers. If there is the slightest tinge of the yellow stain from the bichromate of potash in either the print or single transfer paper, or in the temporary support, the immersion in the alum bath must be continued until the tint has totally disappeared. After this treatment, the prints are washed for half an hour in gently running water, or in several changes, and hung up by clips until thoroughly dry.

Double Transfer Method. In the use of the double transfer method, we have choice of a variety of "temporary supports," and the final support, or base on which the finished print remains, may be almost any surface desired, as paper, wood, ivory, glass, opal, celluloid, canvas, leather, etc.

Flexible Temporary Supports. We will take up first the making of a double transfer print on paper, and use, as the most convenient of temporary supports, the commercial paper supplied as "flexible support." This is simply paper coated with insoluble gelatine and shellac. It comes in rolls or cut sheets, and is comparatively inexpensive, as it may be used repeatedly. Before using it must be waxed, i. e., a thin film of wax must be spread over its entire surface. After each time of using, also, this "flexible support" must be thoroughly dried and again waxed before use. The waxing preparation can be bought, or made as follows: Dissolve yellow resin, 6 drams, and pure beeswax, 2 drams, in one pint of turpentine. This waxing solution should be used some time before the support is required, so that the turpentine has time to evaporate. To apply the wax coating, put a little of the solution on a piece of flannel or wad of absorbent cotton; lay the sheet of temporary support on a board or table and rub the wax lightly over the face of the support. When all the supports have been waxed, go back to the first sheet and, with a large tuft of absorbent cotton, polish each sheet in turn. Care must be taken not to rub the wax off entirely at any point; what is needed is a thin film



GRAPES
Frank Bement
Reproduced by courtesy of William H. Rau

THE LAST LOAD
Lewis F. Stephany

of wax over the whole surface of the support. All temporary supports, flexible or rigid, as opal, celluloid, etc., must be waxed in this way before they can be used.

Rigid Temporary Supports. Some workers use glass as a temporary support. This is not recommended for the beginner, but is useful where a print with a highly glazed surface is desired. A faultless piece of glass or polished opal is chosen and thoroughly cleansed in caustic potash and a few drops of liquid ammonia. When dried it is dusted with French chalk or "talc" by gently striking it with a little flannel bag filled with chalk, and waxed as described above. The plate is now given a thin coat of collodion, the surplus solution being drained away, and the plate levelled until the film sets. This transfer collodion is readily obtainable from dealers. When plates so collodionized have set they should be placed on edge in cold water for half an hour, until the solvents in the collodion are washed away and all greasiness of surface has disappeared. If a matt surface finish is desired in the finished print, matt opal or grained zinc plate must be used for the temporary support.

The transfer to these supports is made precisely as described in the making of single transfer prints, except for the slight differences necessary in handling glass or celluloid supports instead of paper.

The Final Support. The exposed tissue is first transferred to the temporary support, developed, alumed, and washed as already described. The second transfer to the final support can be made while the prints are still wet from the first transfer, but is preferably made after they have been permitted to dry. The "double transfer" paper or final support can be bought in rolls or cut sizes. It does not keep well, hence too large a quantity should not be bought at one time. It is a plain paper coated with gelatine and alum, and its preparation is a somewhat difficult task. If any special paper is desired for the final support it must be coated as follows: Prepare (I) gelatine (Nelson's or Heinrich's), 2 ounces; water, 16 ounces. (II) Chrome alum, 12 grains; water, 2 ounces. Soak the gelatine in the water (I) for 20 minutes and then dissolve by gentle heat. When thoroughly dissolved add 6 drams of II in 4 ounces of warm water. Coat the paper with the mixture while still warm, and let it thoroughly dry, suspended by clips in a dry room. When required for use, coat the paper again with the warm chrome-gelatine solution, and bring the image on its temporary support into contact with the gelatine coating while it is wet. Then squeegee into absolute contact. It is, however, much simpler to use the ready prepared paper at first.

To make the final transfer, first soak the final transfer paper in water at 90° to 100° Fahr. until the gelatine surface is soft, spongy, or slimy, the idea being to get a perfectly soft, yielding bed for the carbon image on the temporary support. Place in a tray of cold water for a moment, with the carbon image on its temporary support, and withdraw the two together to avoid air-bubbles. Squeegee lightly but firmly and clip up in a dry room. Special directions accompany the Autotype double transfer paper and can be found in the packages or rolls. In five or six hours, if then thoroughly dry, insert the point of a knife between the temporary and final support and pull the two apart. If the former has been properly waxed and the final transfer papers was in good condition and properly soaked, the carbon image will be found to have adhered to the gelatine surface of the final support, and will leave the less tenacious waxed surface of the temporary support, thus giving the second transfer and a non-reversed image. The surface of the image will now have a finish exactly corresponding to that of the temporary support employed. If the final support is so old that the gelatine surface has become partly insoluble and will not soften, soak it in water at a higher temperature until it is soft and spongy. If even with quite hot water it will not become soft the paper is probably worthless and should be thrown away. When soaked in water at a higher temperature than is absolutely necessary to soften the gelatine coating, the latter is apt to be washed off generally or locally and all or a portion of the picture will be left on the temporary support. The same thing will happen if the temporary support has not been properly waxed.

If there is any wax on the carbon image after stripping, it can be removed by rubbing gently with a tuft of absorbent cotton dipped in wood alcohol. The print is now finished and can be trimmed and mounted.

Tranfer to Other Supports. One of the great advantages of the carbon process is that the prints can be transferred to almost any material. The operations are almost the same in all the cases, and are subject to two general rules: first, if the surface of the material is not itself flexible, a flexible temporary support must be used, and second, the surface must be first prepared to receive the image.

For coating such surfaces one of two methods can be used: first, the bichromate method in which bichromate of potash is added to gelatine so that after prolonged exposure to light the latter becomes insoluble, and second, the chrome-gelatine method in which chrome alum is added to the gelatine and so hardens it. In either case the solution is made up in the same manner as described for the coating of single transfer paper, except that slightly different proportions are used. Wall gives the following formulæ, either of which may be used: (1) Heinrich's gelatine, 1 ounce; distilled water, 18 ounces. Soak and dissolve by heat as before directed, add slowly a solution of 20 grains of potassium bichromate in 2 ounces of water. Coat the paper as thinly as possible, dry, and exposed to strong light for several hours. (2) Heinrich's gelatine, 320 grains; distilled water, 20 ounces. Dissolve as before and add chrome alum, 12 grains; water 4 ounces. Filter and coat thinly.

In transferring to wood or other porous substance, the pores must be filled in some way as far as possible. Wall recommends Aspinall's enamel thinned down with turpentine and rubbed in with a pad. I presume any good American enamel would serve the same purpose.

In transferring to the matt side of opal plates or to celluloid by the single transfer process no preparation is needed beyond thoroughly cleaning the surface with French chalk. The image will adhere perfectly, but will not bear as much rough handling as if the opal plate be first coated with albumen as directed in the single transfer method. If the double transfer process is to be used, prepare the plate with either the gelatine bichromate or chrome gelatine solution as directed, making the transfer from the "flexible support."

With the above rather general information taken in connection with the specific directions given before, the worker will find little difficulty in making the transfer to any support he may desire,—wood, metal, glass, canvas, or almost any other material.

A Modified Method. A method of making carbon prints on any kind of paper was recently published in *Photography*. A ground glass or smoothed opal plate is first waxed as directed and used as a temporary support. The print being developed, alumed, and rinsed, as before described, apply to it two coats of a well-filtered three per cent solution of gelatine at about 68°, and allow it to set. The paper on which the print is finally to appear is then moistened and placed on the gelatine surface and squeegeed lightly, when, after drying, it can be stripped in the usual manner. Max Bölte recommends the same process for putting carbon prints into books and similar objects except that here a flexible temporary support is used.

Transparencies. The uses of transparencies in carbon are twofold, first as an independent branch of carbon work, and second as a medium for the making of enlarged negatives. For the first purpose any of the tissues can be used, when mounted with ground glass in the usual way, but for the second the only really suitable tissue is the transparency black. Positives so made possess a richness of shadows and high lights not obtainable by any other process, and are by all odds the best medium for making enlarged negatives. When designed for this purpose the printing is carried rather far and the image is developed as far as possible without strong contrasts.

A very unique method of using transparencies from colored tissues has been devised by Chapman Jones, and consists in making a thin positive on glass, backing it with paper of any desired surface, color, or tone. This method results in brilliancy without hardness and non-reversal, since the pictures are viewed through the glass. The method is well worth a trial.

There are several methods of preparing glass for single transfer. Weston recommends the use of clean glass without any substratum whatever. The tissue is transferred directly to the glass, only adding 16 drops of hydrochloric acid for every quart of water in which the paper is to be immersed, and allowing the prepared paper to remain in this water a little longer than usual. Develop as usual.

Or the glass may be treated with either the chrome gelatine or bichromate solution given on a preceding page. A number of plates of glass can be coated at one time, as the coating does not deteriorate with age. It is sometimes recommended that, in addition to coating the glass plate, the tissue itself be given a coat of transfer collodion before the transfer is effected. The collodion holds the surface of the tissue together, and is therefore rather necessary in the case of a glass support where the adhesion is necessarily not so great as on paper. To coat the tissue, turn up the edges to form a dish and pour into it the transfer collodion, allowing the surplus solution to run out at one corner. When dry, trim off the turned-up edges and make the transfer in the usual way. Or, instead of squeegeeing the tissue to ferrotype plates after sensitizing, it may be dried on waxed and collodionized glass plates, when it will peel off with a collodion surface. An excellent substratum recommended by Max Bölte is a thin solution of gutta percha in chloroform, the plate to be perfectly dry before using.

Lantern Slides. As the ordinary tissues are not altogether satisfactory for transparencies, neither are they suited for the making of lantern slides. The proportion of pigment to gelatine in the coating of the tissue, while suitable for a positive on paper, is not great enough to bear the strong light of an optical lantern. The heaviest deposits possibly obtainable are too thin to satisfactorily render heavy shadows. However, by using the darker and stronger colors in the tissue, by printing from strong negatives, by using tissue five or six days old, and by using a light in the lantern which is white but not overstrong, fairly satisfactory results can be achieved. But for the best results what is known as "transparency tissue" should be used. Unfortunately this comes only in black, and not a very good black for slides at that. Still the slides can easily be toned as set out further on. As a matter of course, slides must be made by contact.

Any of the substrata heretofore set out can be adopted for use with slides, thin cover glasses being used for the purpose. The cover glasses are first thoroughly cleaned with caustic potash and ammonia, and thoroughly polished. If they have come direct from the store they need only be dipped in alcohol and polished. A simple method of preparing them to receive the carbon image is to dip each glass in a pint of water to which has been added 10 to 15 drops of ammonia, and into which has been thoroughly beaten the white of one egg. They are drained and racked up to dry. A hundred slide-plates can be so prepared in a half hour and will keep indefinitely. The transfer, development, etc., are all as already set forth for the single transfer process. As the slides are reversed the register marks need only be reversed in order to have the picture right on the screen. In working with the transparency tissue one-half more exposure is required than with ordinary tissues. A lantern-slide mask can conveniently be used to form the safe edge. If desired, clouds can be printed on a separate glass and bound up face to face with the foreground slide.

Toning and Intensifying. There have been many methods published for toning or intensifying carbon prints. I cannot agree that the modification is a desirable one, but give one or two formulæ for experiment. Wall gives the following method for use with either prints or transparencies: Soak the picture for a few minutes in a solution of nitrate of silver, 2 grains in 1 ounce of distilled water, rinse and flood with pyrogallic acid, 1 grain; citric acid, 1 grain; water, 1 ounce; to which are added, at the moment of using, two or three drops of a twenty per cent solution of nitrate of silver. After intensification the prints should be dipped in hypo and well washed. He also recommends dipping the prints into a solution of 20 grains of permanganate of potash in 1 ounce of distilled water; wash well and dry, repeating the operation if necessary.

The Monckhoven formula for obtaining beautiful purple-black or dark violet tones (presumably with the black tissue) is as follows: Immerse the print for five minutes in sulphate of peroxide of iron, 40 grams; water, 1 liter (four per cent solution); rinse and immerse for ten minutes in carbonate of soda, c. p. 40 grams; water, 1 liter (four per cent solution); rinse and immerse in gallic acid, 10 grams; water, 1 liter (one per cent solution), for a variable time depending upon the tone desired. Thoroughly wash and dry. As this is an intensifying process, the original prints should not be too deep.

Transparencies on clear glass or collodionized plates (not gelatinized) in order to change the actinic value of the transparency may be treated by simply immersing for a few seconds in equal parts of (1) permanganate of potash 4 parts, water 1,000 parts, (2) white sugar 2 parts, ammonia 2 parts, water 1,000 parts.

In addition to the above methods, which are more in the nature of chemical toning, carbon prints can be colored or intensified by flowing with a saturated solution of permanganate of potash; or with artificial alizarine dissolved in water to which some liquid ammonia has been added; or with any of the aniline colors, which last, however, are not apt to be permanent. A dark blue-black tint is obtained by flooding the print with extract of logwood dissolved in warm water; after rinsing, a 3 per cent solution of bichromate of potash solution is applied for three seconds. Repeat until desired tint is obtained. These, however, are purely experimental formulas.

Printing in Skies. The following method for printing in skies in carbon prints is set out in the Autotype Company's *A B C Guide*, and is copied verbatim because of its succinctness. Hold the landscape negative up to the light with a piece of white paper against it, trace roughly the sky line with a black lead pencil, lay this tracing on a piece of yellow paper and go over the outlines with something blunt so as to mark it through onto the yellow paper, which cut with a pair of scissors and trim its edges to the *exact* size of the negative. Having selected the cloud negative, lay the landscape negative upon the cloud negative, so that the cloud effect wished for appears in the sky portion; with a piece of black crayon (which will easily rub off) go round the edges of the landscape negative so as to mark its *exact* position upon the cloud negative, with reference to the cloud effect to be printed. Place the blank which represents the sky upon the *back* of the landscape negative, and place the counterpart (representing the foreground, etc.) upon the front of the cloud negative, the outline tracing of the landscape negative being the guide to position. The printing may now be begun, the state of affairs being this—a sky mask on the landscape negative, a foreground mask on the cloud negative.

Cut a piece of sensitive tissue the *exact* size of the landscape negative, print it in the usual way; when sufficiently exposed, place the printed tissue on the cloud negative, registering it accurately by the traced lines which give the exact size and position of the landscape negative, place in the frame, and with a piece of card just soften the edge of the sky line by moving it up and down over the junction; the exposure will be very short if in a good light, and if the operations are carefully conducted, the results are most effective, as well as satisfactory.

Retouching, Spotting. The necessary spotting required in carbon prints can usually be done by dissolving the gelatine coating of a piece of unexposed tissue in hot water and applying with a brush while still hot and soft. For this purpose it is always well to preserve the trimmings in cutting up the tissue and mark their colors on the back, thus having a complete assortment of all the colors from which prints are made. High lights can be brightened by scraping with a clean rubber or sharp knife after the print is dry, or too heavy shadows can be brought down in the same way.

If desired, the retouching of the print can be done with either water- or oil-colors, but there is frequently no little difficulty in matching the exact tints. If water colors are used a little semi-aqueous and alcoholic solution of purified inspissated ox-gall, or other sizing preparation, should be first applied. If oils are to be used, first prepare the print by an application of 180 grains of isinglass dissolved in 10 ounces of water, to which has been afterwards added an equal bulk of wood alcohol. The retouching or spotting of double transfer prints should be done on the temporary support, before final transfer.

If after finishing there is a dullness about the print its brilliancy can be restored by coating thinly and evenly with linseed oil 4 parts, painter's driers, 1 part.

Trimming and Mounting. Carbon prints are trimmed and mounted exactly as are any other prints. Prints on celluloid present difficulty because of the rigidity of the support. A good glue or rubber cement is the best remedy I can advise, with heavy pressure after mounting. This applies also to large prints on heavy weight or thick paper; Le Page's glue is excellent for the purpose. For prints on thin or moderately thick papers, Millen's paste will be found most useful. It possesses greater sticking capacity than any other prepared paste in the market. If prints are wetted, and placed in a pile before applying the mountant, it is well not to soak them too long, or to attempt to mount too many at one time. The gelatine surface, although insoluble and alumed, is still gelatine and absorbs water to some extent. A little care, however, will obviate any difficulty.

Here, for the present, the case for the carbon process must rest. I have by no means exhausted its many interesting features, and the tricks of bichromated gelatine could well supply material for a little book wholly devoted to "Failures and Remedies." But my object has been to get the reader interested. There are other carbon processes, modifications of the original and generally used process here outlined. Among these *Ozotype*, *Gum-Bichromate* and the *Artigue* processes will be readily recognized by name with those readers who are acquainted with current photographic literature. Concerning these three methods a separate monograph will be published later. The public interest in *Ozotype*, however, is just now so keen that a brief description of the method is here given. The process is a patented one and requires special materials for its working which are not yet obtainable in America. Hence it is better to postpone a practical consideration of its merits and working until we can speak of it from experience. In the preparation of the foregoing pages, Mr. Osborne I. Yellott has again helped me most liberally from his experience, and his help is here cordially acknowledged. A list of the various manuals devoted to the process is also given, as usual, at the end of the monograph.

Ozotype. Briefly described, ozotype is a printing method originated about a year ago by Mr. Thomas Manly. It resembles the carbon process in that a pigmented gelatine tissue is required to produce the print and, as a consequence of this, it gives prints in permanent pigments. It differs from the carbon process in that it gives a visible image after exposure, and requires no transfer of the image. Like carbon, it offers a wide range of color effects and a variety of surface textures is permissible by proper choice of paper for the supports. The following outline is condensed from the manual on *Ozotype* recently published, from the pen of Mr. Manly.

Papers. Any suitably sized paper is taken, according to the fancy of the individual worker, and sensitized with the special sensitizing solution—a commercial (patented) preparation. Thus smooth drawing papers of good quality, or single transfer carbon paper, or a plain photographic paper may be used for small prints. For larger sizes and broader effects Whatman's, Arnold's, Michallet's or LePage's papers are advised. Collotype printing papers are particularly recommended. The sizes most convenient for practical use are given as 20 x 25, or 19 x 24 inches.

Sizing. For sizing, a convenient solution, ready for use at any time is LePage's fish glue, 1 ounce; hot water, 9 ounces. The operation of sensitizing is said to be more easily performed if the sensitizing solution is applied before the sizing is quite dry. The paper may be sized with a flat hog's-hair varnish brush, but for smooth papers a 3-inch camel-hair brush should be equally effective, it distributes the size more evenly and is less likely to disturb the surface finish of the paper. The sized paper is now dried.

Sensitizing. Sensitizing should be done in gaslight, not too intense a light. Two drams of sensitizing solution are needed for a sheet of paper 25 x 20 inches. The composition of the patented sensitizing solution is, of course, a secret, but the following formula may be taken as approximate: Manganese sulphate, 5 drams; potassium bichromate, 3 drams; water, 10 ounces. The paper is stretched on a sheet of newspaper on a table, fastened with drawing pins; the two drams of solution are thrown in a pool at the center of the sheet and quickly spread with the brush over the whole surface of the paper before it has time to soak into the sheet. After sensitizing the paper is dried in darkness.

Printing is done under a negative in the usual way, but the image prints out, giving an olive-brown picture upon a yellow ground. The paper prints less rapidly than carbon tissue. When sufficiently printed the prints are washed in three or four changes of water, taking thirty minutes or so, and then hung up with clips to dry. This will take perhaps twenty minutes, after which the sensitive paper may be cut up to convenient sizes.

Pigmenting the Print. The next operation, known as pigmenting the print, may be done at any time within ten days after the foregoing. The print, with a piece of "pigment plaster"—the special patented form of unsensitized carbon tissue introduced for the process (a piece of unsensitized carbon tissue will serve for experiment)—is immersed in a bath composed as follows: Water, 20 ounces; glacial acetic acid, 30 minims; hydroquinone, 7 grains; ferrous sulphate, 5 grains. This is known as the acetic bath, and varies in composition according to the strength of the negative. It should be made fresh each time, and used at a temperature of from 65° to 75°. After immersion in this bath for about a minute the print is brought into contact, face to face, with the pigment plaster, and the two are withdrawn together, squeegeed, blotted off, and dried.

Development. When dry the print is developed with warm water, as directed for the carbon process. Thus the print and pigment plaster, closely adhering, are put into cold water for twenty or thirty minutes, then plunged into water at 105° Fahr. After a minute in this bath the paper backing of the plaster can be pulled away. This requires a good straight pull, and should be done under the surface of the water. The print is now pulled up onto a sheet of zinc and laved with warm water until the picture is fully developed, after which it is rinsed in cold water and alumed in a bath made up of: water, 20 ounces; alum, ¼ ounce. This completes the print, and, when dry, it is ready for mounting. The picture-image is, of course, non-reversed.

BOOKS.

Carbon Printing. By E. J. Wall. 104 pp., with a carbon print. 5th edition. 1900. (Eng.) 50 cts.

Carbon Printing. By W. Weston. 64 pp. 1896. 75 cts. This relates to the working of Elliott's tissues.

Carbon Printing. By Max Bölte. 32 pp. 2nd edition. 1893. 50 cts. A full and practical manual.

A B C Guide to Permanent Autotype (Carbon) Photography. By J. R. Sawyer. Latest edition. 1898. 104 pp. Illustrated. Cloth. $1.25.

Ozotype. By Thomas Manly. 77 pp. 1900. 50 cts.

NOTES.

The September number of THE PHOTO-MINIATURE will, we believe, prove to be one of the most enjoyable, as well as the most profitable, of the series thus far published. It will be titled *Chemical Notions for Photographers*, and has been written and illustrated by Mr. Thomas Bolas.

There is an old saying that "all things come to him who will but hustle while he waits," and for a long time we have been hustling and waiting for the right man to write a very plain and very simple introduction to the chemistry of everyday photography. Mr. Bolas is the man for whom we have waited, and the September number of THE PHOTO-MINIATURE is the book we desired.

The chemistry of photography is a complex subject and one which must forever read drily to the average individual, however anxious he (or she) may be to know "the reason why" this or that happens. For this reason books on photographic chemistry are eagerly bought—and put away unread. Mr. Bolas has recognized the difficulty and has prepared, not an exposition of any system of photographic chemistry, but a marvellously interesting and practical explanation of the everyday problems concerning which photographers are curious. But you must see the book. We have unusual pleasure in being able to offer it to those who need it.

❧

The reprint (*8th thousand*) of THE PHOTO-MINIATURE, No. 8: *Photography at Home* is now ready for delivery. For the benefit of new readers of the magazine we summarize the contents of the number, which is devoted to a simple explanation of photography as a home hobby. *The Scope of Home Work; Light Indoors and Out; Actinometers and Their Usefulness; Exposure Meters; Photographing Interiors, the Apparatus Required, Lenses, Plates and Their Backing; The Choice of View, Illumination; Interiors by Gaslight and Flashlight; Exterior and Interior Views Combined; Home Portraiture by Daylight and Artificial Light; Flashlight Powders and Their Use; Lighting the Subject; Backgrounds; Photo-*

graphing Flowers; Enlargements by Daylight and Artificial Light; Bromide Prints; Copying; Positive Films; Sensitol Prints on Paper and Fabrics.

Reprints of No. 5: *Stereoscopic Photography;* and No. 11: *Developers and Development* are now in press. These will apparently be closely followed by a *third edition* of No. 3: *Hand-Camera Work;* and *second editions* of No. 10: *The Blue Print*, etc., and No 12: *Retouching Negatives and Prints.* Surely this proves that the little books are generously appreciated!

◆

The twentieth annual convention of the Photographers' Association of America, commonly known as the National Association, met at Milwaukee, Wis., from July 23 to 27, inclusive, under the leadership of Mr. S. L. Stein, of that city. This being the first national convention held in the West for some years, the Western professionals gathered in great force, and the affair was a huge success in every way.

The official report of the proceedings, *literatim*, may be found in *Wilson's Magazine* for August; here we can make room only for brief mention of a few of the chief features. These included a series of meetings devoted to the discussion of topics pertaining to professional work; an exhibition of the best professional work of the year; and a representative display of the year's novelties in apparatus and supplies.

With few exceptions the profession was represented by its most prominent members, and among the visitors present we noticed Mr. Otto Sichel and Mr. Asanuma, well-known dealers from London and Tokio respectively. At the opening session President Stein gave an address marked by its common sense advice to professionals, urging them to put aside petty jealousies, to give more thought to originality rather than imitation in their work, to keep their prices as high as possible, and to avoid extremes in styles. This was followed by an interesting report of the progress of photography during recent years by Mr. W. I. Scandlin, editor of *Anthony's Photographic Bulletin*, and an illustrated lecture on the principles of beauty in art by Mr. O. W. Beck, of the Cincinnati Museum of Fine Arts. Among the other papers read at the various meetings was one on photographic copyright, by Mr. Waldo, of the Photographers' Copyright League; another on lighting the subject in portraiture, by Mr. Beck; and two lengthy "talks" on things in general, by Mr. A. H. Griffiths, of the Detroit Museum of Art.

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Among the side-shows of the convention, a visit to the Layton Art Gallery, with a capital account of its pictorial treasures, by Mr. Eldridge, the curator; a demonstration of the Ives Krōmskōp system of color photography; and a similar exhibition of the McDonough system deserve mention. The possibilities of color photography, by the way, seem to have excited great interest and admiration in those attending the convention, which seems to show that the professional is not conversant with recent advances in this direction.

The displays made by manufacturers and dealers were much in advance of the showing made at recent conventions and, according to reports, resulted in a big volume of business.

Detroit was chosen as the location for the convention of 1901, and the officers elected were as follows: *President*, E. B. Core, of New York; *first vice-president*, D. D. Spellman, of Detroit; *second vice-president*, H. S. Klein, of Milwaukee; *secretary*, J. G. Nussbaumer, of Buffalo (re-elected). The office of treasurer is held by F. R. Barrows, Fort Wayne, Ind., for two years. Knowing these gentlemen, we can sincerely congratulate the association upon its choice of officers for the ensuing year. In their hands the success of the next convention is thoroughly assured.

The pictorial exhibits were as interesting as ever, but included too large a proportion of poor work. It was a matter of general opinion that the best work shown was better than any previously exhibited; but the exhibitors in the minor classes fell too far behind their fellow competitors in the higher grades. This simply shows that the average professional is not thinking hard enough. Another defect, noted by the judges, was the uneveness of the work sent by individual exhibitors. This indicates a lack of the faculty of criticism, and should be amended. It is not at all difficult to judge one's own work if we will begin by being severe enough, and never giving oneself the benefit of the doubt.

Among the pictures worthy of mention with praise were the complimentary exhibits of Core, Hall, Spellman, Reeves, and Knaffl Bros. The collection sent by J. C. Strauss, of St. Louis, contained some novel effects in lighting, but the quality of the work was undeniably high. Geo. M. Edmondson, of Cleveland, exhibited a delightful example of figure portraiture, as did A. J. and W. G. Thuss, of Nashville. We were pleased to see this latter firm coming forward in the way it did. E. F. Hall, of Buffalo, sent a few silhouettes notable for the subtlety

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of their treatment, and very attractive to the eye; and Dudley Hoyt, of Rochester, showed a standing figure so delightfully portrayed within its space that the desire to own it was almost irresistible.

The miniatures formed a special class and were altogether enjoyable. D. Rosser, Pittsburg; Dudley Hoyt, J. E. Giffin, Wheeling; A. L. Bowersox, Dayton; Moses & Son, New Orleans, and I. Benjamin, Cincinnati, were especially strong in this class of work.

Geo. H. Van Norman, Springfield, Mass., sent a fine collection of portraiture, showing wonderful delicacy in the balance of light and shade in the faces and throughout the figures. Henry H. Pierce, Providence, R. I., exhibited a portrait of an elderly man which we considered equal to the best example on the walls.

The official prize-list, showing the opinion of the judges, follows herewith:

AWARDS OF PRIZES.

Grand Portrait Class. 1st prize, life-size figure bust, Moore & Stephenson, Atlanta, Ga.; 2d, gold medal, Dudley Hoyt, Rochester, N. Y.; 3d, silver medal, J. E. Giffin, Wheeling, W. Va.; 4th, bronze medal, E. C. Dinturff, Syracuse, N. Y.

Genre Class. 1st prize, figure head, E. S. Curtis, Seattle, Wash.; 2d, gold medal, G. Moses & Son, New Orleans, La.; 3d, silver medal, Baker Art Gallery, Columbus, O.

Miniature Class. 1st prize, gold medal, I. Benjamin, Cincinnati, O.; 2d, silver medal, D. Rosser, Pittsburg, Pa.; 3d, bronze medal, Dudley Hoyt, Rochester, N. Y.; 4th, diploma, G. Moses & Son, New Orleans, La.

Class A. 1st prize, gold medal, Elias Goldensky, Philadelphia, Pa.; 2d, silver medal, A. F. Proctor, Huntington, W. Va.; 3d, bronze medal, W. M. Morrison, Chicago, Ill.; 4th, diploma, E. S. Curtis, Seattle, Wash.

Class B. 1st prize, silver medal, E. E. Dexter, McKeesport, Pa.; 2d, bronze medal, A. F. Proctor, Huntington, W. Va.; 3d, diploma, C. S. Bateham, Norwalk, Ohio.

Class C. 1st prize, silver medal, Louis Schreiber, West Bend, Wis.; 2d, bronze medal, J. F. Denninger, Neenah, Wis.; 3d, diploma, A. L. Jackson, Tacoma, Wash.

Landscape Class. 1st prize, silver medal, H. C. Myers, Boise, Idaho; 2d, bronze medal, J. H. Field, Berlin, Wis.; 3d, diploma, Robert Wilkinson, Montpelier, Vt.

Marine Class. 1st prize, silver medal, Charles E.

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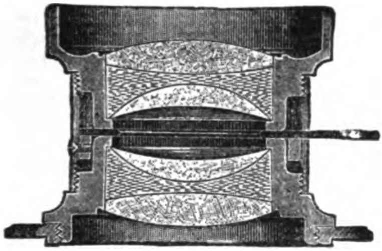

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Bolles, Brooklyn, N. Y.; 2d, bronze medal, H. R. Fitch, San Diego, Cal.; 3d, diploma, H. H. Morrison, Seattle, Wash.

Geo. H. Van Norman's exhibit arrived too late for competition, but won much admiration, and it was awarded a special award by consent of the convention.

A word of praise must also be given to the work shown in the landscape and marine classes. The pictures sent by J. H. Field, Horace C. Myers, and Chas. E. Bolles, in these two classes, showed an appreciation of the pictorial side of outdoor photography not often seen in professional work.

❧

The British Patent Office has issued a bibliographical catalogue of all the photographic works at present available in the library of the Patent Office. This should be secured by all interested in the bibliography of photography. The list covers 62 pages, comprising 557 works (73 serials, and 484 text-books) representing 1,300 volumes. The catalogue headings are 68 in number, giving in all 708 entries. According to this showing the library lacks considerably in the matter of completeness. A copy of the catalogue can, we believe, be obtained by sending twenty-five cents in stamps to the Controller-General of Patents, Her Majesty's Patent Office, London.

There is a fairly large section devoted to photographic books at the United States Patent Office, at Washington, but we are not aware that a printed list of these is obtainable. Some years ago we copied a list of the books represented there up to 1875, and it numbered over two hundred volumes. This number should be considerably augmented by this time.

❧

The International Exhibition which is to be held at Glasgow (Scotland) next year will have a special section devoted to the display of photographs obtained by invitation. Mr. J. Craig Annan, who has charge of this section, has taken unusual pains to get together a unique collection of the finest examples of photography obtainable, and the exhibition will probably offer, what the Paris Exhibition fails to show, a really representative exhibition of the best work done in photography by British, American, Austrian, Belgian, French, Italian, and German workers. At this rate a pilgrimage to St. Mungo's city next year should well repay those able to make it.

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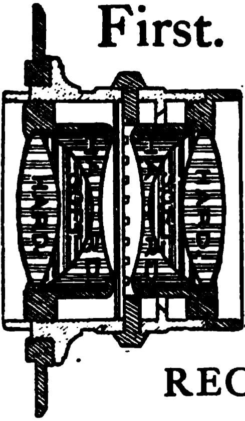

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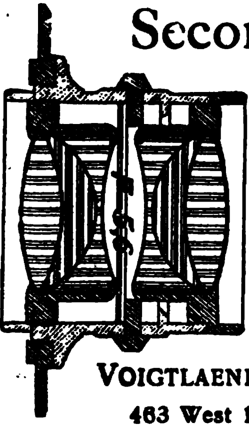

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This, says the *British Journal of Photography*, is how Sir W. B. Richmond, R. A., proposes to revolutionize art-teaching: He would place in a well-lighted room photographs of the finest pictures of the world, as well as some tables and chairs, and pencils and paper; and he would let the working man go there and absorb the beauties of art until they became part of his nature; furthermore, he would let him smoke his pipe in the meantime if he cares to do so. His idea is that in time the man would begin to copy the beautiful things around him, and would have developed in him the most human part of his sensibilities. This, in effect, is what Sir W. B. Richmond said at the opening of the Loan Exhibition of Pictures at Deptford last week. The idea is certainly excellent in theory, and one would like to see how it would work in practice. By the way, speaking of photographs of the best paintings of the world, it may not be generally known that permanent pigment prints, about 9 by 7 inches, of the best pictures in the British and Continental National Galleries are to be had in England at retail for 25 cents each. These should prove an immense boon to art students of limited means on both sides of the Atlantic.

◆

Time was when American lenses and lens-makers were held in little repute, and only an imported lens had any chance when the photographer wanted "a really good lens." Times have changed, and it is now recognized that the American-made lens is fully equal to that made in Europe. Toward this desirable change of opinion no firm has done so much as the Bausch & Lomb Optical Company, of Rochester, N. Y., whose Alvan G. Clark and B. & L. Zeiss lenses are now used by thousands of American photographers with complete satisfaction.

We learn with interest that this growing demand for their lenses has obliged the Bausch & Lomb Company to again enlarge their factory, and a new wing is being added which will give the firm additional working area of almost 40,000 square feet. This, added to the present floor area of 138,000 square feet, will make the Bausch & Lomb factory the largest building in the world wholly devoted to the manufacture of lenses and photographic shutters.

The catalogue of photographic lenses published by this enterprising house is one of the most interesting books of its kind. A copy may be obtained for the asking by readers who, in writing, will mention THE PHOTO-MINIATURE.

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Among those things which no fellow can understand is the common practice, among American photographers, of printing in the sun. Looking over the roofs of New York from Mr. Falk's studio window some days ago—over 200 feet above the level—we counted some five or six photographic establishments, on the roofs of which photographic printing was being done in the full glare of the sun. Printing in the sun instead of in the shade saves time, but the excuse is a poor one during the intensely bright summer days in New York. We quote a sensible paragraph on this subject from *Photography:*

There is a great temptation to many workers to hurry up their printing still more by putting the frames in the sun. The inferiority of prints so made over those produced in the shade is not so marked in winter-time, because the printing then—even in the brightest weather—takes a considerable time, and time is the essence of the matter. In such weather as we have had lately a print in platinum or carbon may be made in the shade in a few minutes from a negative of average density; a dozen in a day from the same negative should be quite a simple matter. There is, therefore, no excuse for still further hastening so rapid a process by putting the frames in the sun—a course which always gives inferior prints. There are several reasons for this. For one thing, printing in sunshine always has a tendency to reproduce upon the print any defects which may be present on the glass side of the negative. Printed in the shade, these vignette themselves away. In the same way, the softening effect upon any handwork that there may be on the glass side, a softening which the skilful worker counts upon to conceal its presence, is lost by sun-printing unless this takes a long while. In the case of silver prints the color of the image printed in the sun is quite different from that produced in the shade, and this difference of color is never got rid of in the ordinary toning process unless that process is pushed to the point of over-toning. The gradations in a sun-printed photograph are also not the same as those in one from the same negative printed in the shade. The sun-printed one is nearly always inferior. Over and above these defects, which are really unavoidable, there is one which can be prevented, it is true, but which is none the less a real one. We refer to the difficulty of properly controlling the depth to which the printing is to be carried when that operation is very rapid. It is easily controlled when the frames are in the shade, even if a number of them are exposed at once, but when the brilliant July sun that we have lately been having is

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pouring down upon a negative that is not unduly dense, the time taken to get a print has to be judged to such a nicety that a few seconds one way or the other mean failure. Our advice, therefore, once more repeated, is—print in the shade.

❧

According to Gaedicke, discolored platinum prints, in which the whites have yellowed as a consequence of the iron salt not having been completely removed by washing in the usual acid baths, may be restored by immersion in a clearing solution made up as follows: water, 8 ounces; chloride of lime, 300 grains; sodium carbonate, ½ ounce. The defect here spoken of is one which is more general than it should be. Of thirty-two platinotype portraits we examined a week or two ago fully two-thirds were distinctly yellowed in the whites. As most of these prints were made within the past two years, this yellowing could not reasonably be attributed to "the mellowing influence of time" on the paper support.

❧

We note with pleasure the appearance of a fifth edition of *Hammer's Little Book*, beautifully printed and enclosed in a black and red wrapper embossed with the golden hammer which forms the trade mark of the Hammer Dry Plate Co. of St. Louis. Dainty as this "little book" is (it fits the vest pocket), its practical value is its chief merit. Among other good things included in its 32 pages we note the latest formulæ, tables of weights and measures, a short talk on negative-making, and several pages of useful hints on general practice. The book may be had by sending a postal card, mentioning THE PHOTO-MINIATURE, to the Hammer Dry Plate Co., addressed as above.

❧

The *Deutsche Photographen Zeitung* says that Messrs. Meyer & Co., of Görlitz, have introduced a new lens under the title *Aristostigmat*. It consists of two unsymmetrical and uncemented combinations, each having an outer convergent lens and an inner divergent lens. The objective, as a whole, is somewhat similar to the *Planar* and *Unar* types, and is said to work at *f*/7.7 without focal differences when the diaphragm is changed after focusing.

❧

Mr. Francis Galton, whose method of composite photography is well known, publishes in *Nature* (August 2)

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a remarkable paper titled "Analytical Potraiture," in which he relates the results of experiments made to isolate the particulars in which one portrait differs from another. The paper is one which does not lend itself to condensation, but should be secured for reading and reference by those interested in the relation of facial expression and individuality. The subject is by no means as dry as the average reader would suppose it to be, and Mr. Galton's paper will undoubtedly set many people thinking in a new direction. Dealing with Mr. Galton's experiments in *Photography* (August 9) R. Child Bayley adds to their practical interest by illustrating the application of Galton's theories. The two papers should be read together.

◆

Among the new importations in photographic books Tennant & Ward, New York, announce the following of interest to readers of THE PHOTO-MINIATURE:

The Year Book of Photography and Amateur's Guide for 1900. Edited by E. J. Wall. 672 pp. (advts. counted) fully illustrated. Price 50 cents; postage 12 cents extra.

This is the forty-first issue of the *Photographic News Year Book* and, apart from its all-around usefulness as a book of reference, is especially valuable because it contains an exhaustive monograph on the manufacture and manipulation of gelatino-chloride and collodio-chloride printing papers, by the editor.

J. T. Ashby also contributes an excellent paper on "Pictorial Composition for Amateur Photographers;" and H. Vivian Hyde has a very full *résumé* of "Lantern Slide Making," illustrated.

Altogether the *Year Book* has this year surpassed itself and in some measure makes up for the loss of *Photography Annual* which, we learn with regret, has discontinued publication.

Ozotype. The New Carbon Printing Process, without Transfer, Actinometer, or Safe Edge. By Thomas Manly. 77 pp. Cloth boards. Price 50 cents.

American workers who have experimented with *Ozotype*, working along the experimental lines published in the journals during the past year, will welcome the appearance of this authoritative manual of the process written by the originator of *Ozotype*. The materials for the process are now obtainable in the British market and it is rumored that they will, ere long, be introduced on this side of the Atlantic also.

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6	9	7½ x 5	8½ x 6½	12 x 10	29
7	11	8½ x 6½	10 x 8	13 x 11	39
8	13	10 x 8	12 x 10	15 x 12	51
9	15	12 x 10	15 x 12	18 x 16	65
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Photography in Colors. By R. Child Bayley. 74 pp. Flexible boards. Price 50 cents.

The contents of this convenient guide to some of the best-known methods of producing photographs in color are best indicated by the headings of its chapters, as follows: I. The Nature of Color; II. The Undulatory Theory of Light; III. The Lippmann Process; IV. The Principles of Color Vision; V. The Ives Process; VI. The Joly Process; VII. Colored Lights and Pigment Colors; VIII. Three-Color Lantern Slides; IX. The Diffraction Grating Process; X. Three-Color Mechanical Prints; XI. Other Three-Color Processes.

◆

The Voigtlænder & Son Optical Company, 467 W. 14th St., New York, sends us a new edition (the fourth) of their catalogue of *Collinear Lenses*, *Telephoto Attachments*, and *Porro Prism Binoculars.* This issue is a big improvement on the earlier editions, and offers much useful information on the choice and use of *Collinears* for various purposes, together with particulars of the styles of *Collinears* adapted for use with kodaks and other hand-cameras. A full description of the new *Porro Prism Binoculars* is also given, with prices for those enlarging from three to twelve diameters.

◆

A capital little book, which may lack appreciation from the quiet way in which it is being put into circulation, is *The Photographic Way of Doing Things*, written and published by Ottamar Jarecki, of Erie, Pa., at twenty-five cents a copy. The book comprises 48 pages, and gives a series of very practical lessons in photography. It is written in an easy, readable style, especially suitable for the beginner, and contains much common sense information touching everyday practice. Mr. Jarecki deserves considerable credit for the good work he has put into his book.

◆

Pyrol is the latest novelty among developing agents. It is our old friend pyrogallol in concentrated form, manufactured by Hauff & Co., of Fuerbach, and introduced in America by G. Gennert, 24 East 13th St., New York.

Pyrol comes in the form of crystals and occupies one-sixteenth the bulk of pyrogallol, a pound bottle of *Pyrol* being of the same size as an ounce bottle of pyrogallol. The advantage of this more compact form of pyrogallol

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will be apparent to all who have used the latter. In addition, it is claimed that *Pyrol* gives a clearer and more brilliant negative than the older form, with less tendency towards fog, and has better keeping quality than pyrogallol, both in its dry state and in solution. The condensed form doubtless explains this latter property, as it certainly offers less surface for oxidation by exposure to the air. A sample of *pyrol* received from Mr. Gennert has, in our necessarily limited experience with it, given negatives quite as good as we have ever obtained with old-style "pyro," and it does not seem to discolor so quickly. The ease with which the crystals can be poured from the bottle, as well as their almost instant solution in cold water, are small but practical advantages.

The chemical nature of *Pyrol* being identical with "pyrogallol C. P. resublimed," there is no necessity for a change in formulæ with those who use the latter. The two formulæ following will, however, be useful to those unaccustomed to developing with pyrogallol.

Pyrol for Seed Plates.—No. 1: Distilled or good well water, 16 ounces; sodium sulphite (Gennert's Neutral), 4 ounces; *Pyrol*, 1 ounce; sulphuric acid, 10 drops. No. 2: Water, 16 ounces; sodium carbonate or sal soda (crystals), 4 ounces. To develop take of No. 1, ½ ounce; of No. 2, ½ ounce, and add water, 4 ounces.

Pyrol for Cramer Plates.—No. 1: Water, 6 ounces; sodium sulphite (Gennert's Neutral), 1 dram; add acetic acid to turn litmus paper red, and then add *Pyrol*, 1 1 ounce. No. 2: Water, 12 ounces; sodium carbonate (crystals), 1 ounce; sodium sulphite (Gennert's Neutral), 2 ounces. To develop take of No. 1, 1 dram; of No. 2, 1 ounce; and add water, 3 to 4 ounces.

❧

An interesting competition which should not be overlooked is that announced by Burke & James, 111 Wabash Avenue, Chicago. This is a friendly contest for users of the *Ideal Ray Filters*, prizes to the amount of $112.25 being offered in the two classes. *Class I* embraces landscapes with cloud effects. *Class II:* Flowers. The simple conditions are as follows. 1st. The negative may be any size. 2d. The exposure must be made through an *Ideal Ray Filter* made by Burke & James. 3d. All prints must be mounted with the owner's name and address on the back of the mount. 4th. Prints must be delivered to Burke & James, marked *Prize Competition* on or before Sept. 30th.

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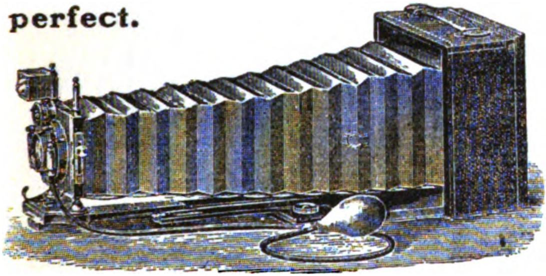

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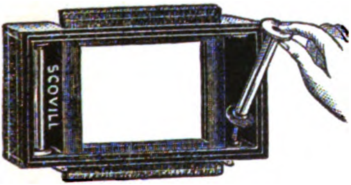

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one of the judges, and the names of the prize-winners will be published in the *Photo Beacon* for November. The prizes include an *Ideal Enlarging Lantern*, value $35; a *Folding Camera*, value $15; a 4x5 *Anastigmat*, value $35; an *Aladdin Burnisher*, value $10; and other small prizes. Readers of THE PHOTO-MINIATURE desiring to enter the competition should prepare and send their prints without delay.

◆

Two publications of interest concerning photographs in colors have recently appeared. The first is a paper read by Professor R. W. Wood on his "Diffraction Process of Color Photography" before the London Camera Club, and published in the Club *Journal* for August. The second is the descriptive catalogue of the Sanger-Shepherd Color Method, which may now be obtained from Sanger, Shepherd & Co., 7 Gray's Inn Passage, Red Lion St., Holborn, London, W. C. This latter displays the completeness to which Mr. Shepherd has brought his process, and is worth having at hand for reference. We had an opportunity, some days ago, to examine a few Sanger-Shepherd color slides, and found them surprisingly faithful in their reproduction of colored objects, and very effective for projection.

◆

The Lansing (Mich.) Camera Club desires us to announce that its rooms at 113 Michigan Ave., East, are open to amateurs visiting the city at any time. At the recent annual meeting of the club, the following members were elected: President, O. T. Allen; Vice President, Miss May McKibbin; Secretary, Miss Mae Wagner; Treasurer, F. J. Hopkins.

◆

The Scovill & Adams Co. has removed from 62 East 11th Street, to 5 West 19th Street, New York, gaining thereby a better location for city business, and increased accomodation for the display of its many new specialties. Under the management of Mr. C. Lamout, this old established house has, during the past year or so, given evidence of progressiveness in many new lines, and the new store is one of the most interesting places, photographically, in New York.

◆

In a recent number of the *Photo-Gazette*, M. G. Mareschall gives a few details worth noting concerning chemical retouching of a negative during development. The prin-

A FEW GOOD BOOKS

THE PERFECT NEGATIVE
A series of chapters on the after treatment of the negative—intensification, reduction, etc. By Rev. F. C. Lambert 135 pp., illus., cloth, 50 cents.

THE PLATINOTYPE PROCESS
A practical handbook, with facsimile prints before and after development. By W. J. Warren. 50 cents.

PLATINOTYPE PRINTING
Written from the pictorial standpoint; illustrated. By A. Horsley Hinton. Cloth, 92 pp., 50 cents.

PHOTO-AQUATINT or The Gum-Bichromate Process. The authoritative manual on this subject. By Maskell and Demachy. 55 pp., 50 cents.

THE GUM-BICHROMATE PROCESS
A later manual than the above. Written by a practical worker. Illus. by W. J. Warren. Cloth, 50 cents.

CARBON PRINTING
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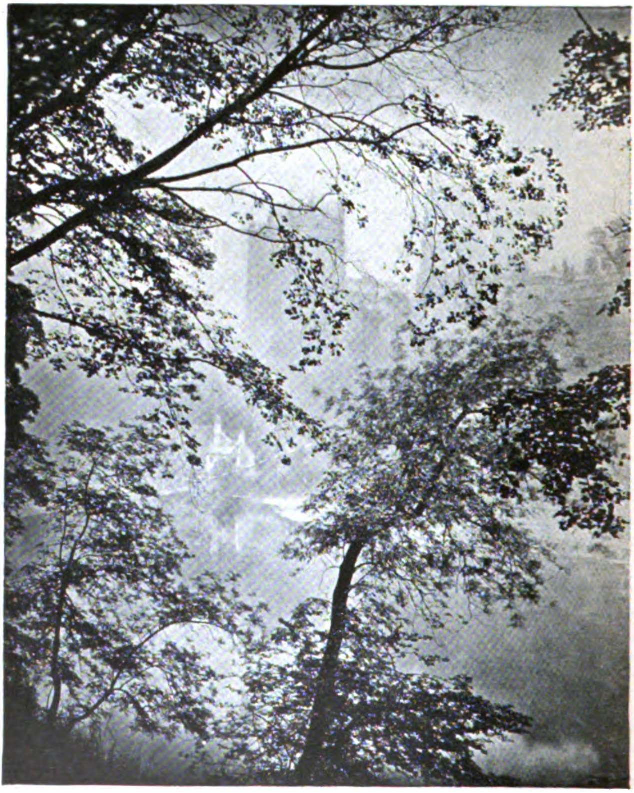
ciple of this method consists in arresting the action of the developer on the parts of the negative which come up too rapidly. For this purpose, as soon as it is apparent that these portions are almost fully developed, the negative is removed from the developer, allowed to drain a moment until there is no free liquid on its surface. Then all the portions where the detail is sufficient are painted by means of a camel-hair brush with a 5 per cent solution of bromide of potassium. The gelatine absorbs this solution very rapidly, and the places may be gone over several times according as the detail is more or less out. The negative is then returned to the developer, and the development continued until the detail comes up in all portions of the negative. The development is nearly or quite arrested wherever the bromide was applied, and these portions do not gain in density. In the end a negative is obtained with detail throughout. It is not necessary to use extreme care in applying the bromide, for on replacing the negative in the developer there is a diffusion which softens the contours of the portions painted; and it is impossible to notice any trace of them in the finished negative. We have tried the method many times, and always with great success. In an instantaneous landscape where the sky was covered with clouds which ordinarily would have disappeared in development, while trying to obtain detail in the landscape, we have applied the bromide with a rather large brush over all the sky as soon as the clouds were well out. In another case it was a white statue on a background of shrubbery; this time a finer pencil was used to paint the statue, and in another case this method enabled us to preserve a few scattered hairs on the head of a friend, who was extremely grateful to us for it.



A MISTY MORNING ON THE WEAR
By the late William McLiesh

THE PHOTO-MINIATURE

A Magazine of Photographic Information

EDITED BY JOHN A. TENNANT

Vol. II SEPTEMBER, 1900 No. 18

CHEMICAL NOTIONS FOR PHOTOGRAPHERS.

This number of THE PHOTO-MINIATURE is an act of faith in the man (or woman) for whom the magazine has been made since its beginning—the man (or woman) who "wants to know." No apologetic foreword is here intended. The little book honestly fulfils all that its title indicates, and I am proud to send it forth. Whether the reader will grasp the significance of the point of view from which it is written is where the act of faith comes in. If the point of view is appreciated, then the work which Mr. Bolas has wrought, with perhaps more than his usual carefulness and skill, will accomplish its mission, and we will all be happy.

In my experience among photographers I have found no desire so strong as the desire to know "something more" about the wonderful transformations of material which make up the familiar processes of photography. It is by no means an easy task to explain these transformations—these changes which result in the picture-images which are the ultimate end of all photography. To attempt this explanation in a complete and intelligible way presupposes in the teacher a very thorough knowledge of the sciences of chemistry and optics. To assimilate the explanation presupposes in the student a greater patience, and a larger inclination to read and experiment, than is possessed by the average individual. And then, life is short and art is long! I know of no book wherein the photographer can get a complete mastery of photographic optics and photographic chemistry, without superhuman effort. There are, it is true, many good books dealing with these subjects in a special way; books which offer much useful information; but optics and chemistry are far too complex to be gathered into a single book, or to be assimilated in one effort, however sustained.

Mr. Bolas recognized this difficulty when he undertook the preparation of his monograph. Therefore, instead of attempting the impossible task of presenting a complete system of photographic chemistry in a few pages, he sensibly gives us an understanding of the backbone of all chemistry—the fundamentals of quantitative equivalence—and a series of connected, coherent notions covering the most frequented paths of everyday photography.

The literal meaning of the word *notion* is *a becoming acquainted;* it is commonly used as a colloquial substitute for the word conception. The intelligent reader will perceive, after he has read what follows, the aptness of the word as describing what Mr. Bolas gives us—a series of conceptions concerning chemistry, rather than a definite system. The common sense of this method, as giving the layman a practical introduction to photographic chemistry, will be apparent. With this introduction a more extended acquaintance with the subject is brought within the reach of all, and so the common desire is accomplished.

A word of warning may be profitable. Mr. Bolas is sparing of his words, and very careful in his choice of them. There are no superfluous words; every word has been measured for its place. One result of this is that what is hereafter written demands a careful reading. Another result is that each successive reading will unfold things unperceived before. Necessarily, those who take up the simple experiments which accompany the text will derive the greatest advantage from what has here been compressed into a small space and few words.—Ed.

A Definition.

Chemistry is that branch of natural science which traces material or substance through the various changes brought about by combination and decomposition.

If we push decomposition (or analysis) to the utmost, we arrive at kinds of material or substance which we call elements (i. e., first principles, admitting of no further division or decomposition) and, as might be expected, the number of substances regarded as elementary changes considerably. In the days of the early Athenian School of Science it was considered that there were four elements (fire, air, earth, and water); thirty-five years ago there were sixty on the standard list, and now there are seventy-four, with a prospect of speedy increase. It must therefore be clearly understood that, in speaking of an element, we simply mean that, at the moment of writing, the substance in question is looked upon as being simple or incapable of further separation. The following may be mentioned as examples of the common elements: Sulphur, Oxygen, Carbon, Nitrogen, Hydrogen, Silver, Gold, Iron, Magnesium, and the metals generally other than mixed metals or "alloys." A complete up-to-date list of the elements is given at the end (Appendix I), and against the name of each element is a symbol or short form of the name, also a number which is called the "combining number" or "atomic weight." The student will have to fully realize the meanings of these symbols and numbers, but we propose to give this information by degrees and as it is required to illustrate definite experiments or reactions.

Force or Energy. Besides the material elements or ponderables, as they are often called because they possess weight, there are certain agencies called force or energy, as Light, Heat, Electricity, or Motion. Neither matter nor force is known alone and apart from the other. We only know matter as associated with force, and we only know force or energy when associated with matter.

Experiments on Matter and Force. Pure or unalloyed silver ("fine silver") can be obtained in quite thin sheets from dealers in bullion, and by simple experiments with this metal, the fundamentals of chemistry may be very advantageously studied, and at the same time photographic theory may be learned, together with much that bears on photographic practice.

Weighing. Weigh out as accurately as you can 108 grains of the fine silver. Although the ordinary small scales and weights of the photographer may be used for this purpose, one who intends to follow up rather exact chemical experiments may advantageously obtain a student's chemical balance, cheap forms weighing to one-fiftieth of a grain being now obtainable. Weight is our usual criterion of the quantity of material or substance in chemical researches, as whatever the changes, combinations, and alterations in volume or form (solid, liquid, gas) which a given quantity of matter or substance undergoes, or however it may be associated with force or energy, the weight remains the same: or, to put the case a little more cautiously, no variation in the weight has been detected. The balance is therefore the chemist's chief guide in tracing matter through its various changes and combinations. Unless the reader contemplates a fairly thorough course in practical chemistry, however, the ordinary form of scales will serve his purpose.

Making Nitrate of Silver. Cut the 108 grains of thin sheet silver into conveniently small pieces and put them into the porcelain evaporating dish, Fig. 1. The weight of the empty dish should be determined and entered in a note-book, or scratched on the porcelain with a diamond. On the silver pour about one fluid dram of water. Now add about twice or thrice as much nitric acid, and apply a gentle heat by means of the spirit lamp or Bunsen burner. A boiling up will commence, red nitrous fumes (take care not to inhale them) are evolved, and the silver dissolves. The silver is now converted into nitrate of silver, but to obtain this salt in the separate state the water and the excess of nitric acid must be removed by drying off or evaporation. To do this safely we use a water bath or steam bath, Fig. 2. As the nitrate of silver becomes dryish scrape it from the sides with a glass rod and turn it over frequently; when no more vapors are evolved allow the dish to cool, wipe the outside, and weigh the dish with its contents. Subtract the weight of the dish, which will give the weight of the nitrate of silver; this should be 170 grains.

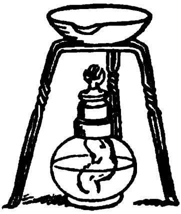


Fig. 1.

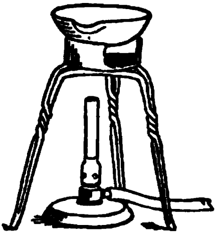


Fig. 2.

Symbols and Equivalence. At the very outset the chemical student must understand these matters sufficiently to evolve or calculate reacting quantities from a given chemical equation. There are no complex mathematical conceptions involved—nothing more than simple addition, multiplication, and subtraction. Although a formula looks complex it is not so in reality, and those who are totally devoid of the mathematical instinct may understand and use chemical formulæ and equations.

Atomic Theory. The combining numbers or atomic weights standing against the names of the elements in the table (Appendix I) are supposed by some to be the relative weights of the ultimate atoms (minutest possible particle) of the respective elements. According to this view, the symbol may stand for the atom thus:

H	stands for 1 atom of	hydrogen	weighing	1	unit
Cl	" " " " "	chlorine	"	35.5	units
Ag (Argentum)	" " " " "	silver	"	108	"
N	" " " " "	nitrogen	"	14	"
O	" " " " "	oxygen	"	16	"

This theory as to the relative weights of the atoms explains many chemical facts and, whether true or not, it forms a good working or provisional hypothesis. The numbers themselves express actual experimental facts, combination and reaction always taking place between simple multiples of the atomic proportions. In our text Ag is regarded as 108, although in the table 107.93 is given (a value which is the outcome of one special series of experiments). It by no means follows that this number is accurate to the second decimal place, or even to the first decimal place, and in actual practice the nearest even number is generally used; except in the case of chlorine 35.5, where exactness is desirable.

Compounds. When the symbolic language is used to signify that two elements are combined together the symbols are simply written side by side; thus HCl signifies that 1 atom of hydrogen weighing 1 is combined with 1 atom of chlorine weighing 35.5, hydrochloric acid being formed. If the smallest possible particle of hydrochloric acid contains 1 by weight of hydrogen to 35.5 by weight of chlorine, any given quantity must contain hydrogen and chlorine in the same proportion, so the formula HCl expresses the general fact that the compound in question contains 35.5 parts of chlorine for each part of hydrogen. The formula expresses much more, but its full signification goes beyond the scope of the present book.

Let us now turn to our nitrate of silver from 108 grains of silver; this nitrate weighing 170 grains. The formula of silver nitrate is $AgNO_3$, the small figure after the symbol for oxygen, O, indicating that 3 atoms of oxygen are concerned.

$$\begin{array}{lr} Ag = & 108 \\ N = & 14 \\ O_3 = (16 \times 3) = & \underline{48} \\ & 170 \end{array}$$

Here we have the proportional or quantitative composition of silver nitrate, whether our unit of reckoning is the weight of the (supposed) atom of hydrogen, or whether we count in grains, ounces, or tons.

In preparing our nitrate of silver we used excess of nitric acid, a procedure which is harmless, as the excess is readily got rid of by evaporation; but in chemical operations it frequently happens that an excess cannot be dealt with so easily, and it then becomes important to use exact quantities. Let us now study the method of finding these quantities.

An Equation. We read in the text-books that when a solution of silver nitrate is mixed with a solution of sodium chloride, there is precipitation or separation of silver chloride as white clots, and the reaction is as follows:

$$AgNO_3 + NaCl = NaNO_3 + AgCl.$$

The numerical value of $AgNO_3$ has already been reckoned up, and it comes to 170. Common salt or sodium chloride is made up of $Na=23$, and $Cl=35.5$, or together 58.5. If then 58.5 grains of common salt are dissolved in water and mixed with the solution of 170 grains of silver nitrate, the silver chloride which is precipitated as a white curd should weigh $108 + 35.5$, or 143.5 grains, and the sodium nitrate which remains dissolved should weigh $Na=23$ and $N=14$, and O_3. Altogether $NaNO_3$ has a value of 85, or to put the preceding equation into figures—

$$170 + 58.5 = 85 + 143.5.$$

Whatever units of weight are selected, the above equation will hold good, and the student who has followed us thus far will have really learned almost everything which is necessary to enable him to calculate equivalent quantities and use the ordinary chemical symbols; still further particulars will be given as occasion arises for using more complex equations.

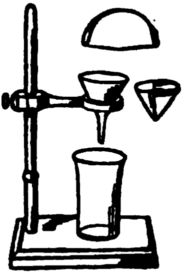
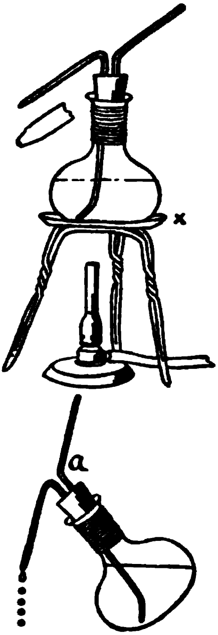


Fig. 3.

Some Chemical Appliances. Liquids are commonly filtered through a folded cone of blotting paper supported in a glass funnel, and precipitated or suspended solids are ordinarily collected on a similar paper filter. Fig. 3 should make all sufficiently clear, including the method of folding the paper. The wash bottle or squirting bottle shown by Fig. 4 delivers a stream of water from the drawn-out jet of the lower tube when the upper tube is blown into; and the force of the stream may be adjusted to suit the washing of precipitates on filters, or for scouring traces of adherent material from the sides of dishes, etc. The wash bottle may be obtained already fitted from the chemical apparatus stores, or the user may fit it himself. The glass tubing may be shaped by softening a length in a gas or spirit-lamp flame and bending over. The contraction for the jet is made by softening the tube somewhat more than for bending, then pulling out; and the tube may be cut wherever required by making a file scratch across it and straining as if to bend, with the scratch outward. Sharp edges may be rounded by cautious heating in a gas flame. The holes in the cork can be made and enlarged to size by means of a rat-tail file. The water in the wash bottle is conveniently heated by standing the bottle on the sand tray as shown at *x* in Fig. 4, and the string-binding on the neck is for comfort in handling when the bottle is hot. If the bottle is so tilted that the jet is lower than the level of the liquid inside the jet tube, the bent tube may be made to act as a syphon and will deliver a very gentle stream for delicate washings, or a series of drops for fine adjustment of quantities, according to the degree of the tilting (see Fig. 4*a*).



Figs. 4 and 4*a*.

A test-tube stand with a supply of thin glass test-tubes is shown by Fig. 5. When a liquid is to be boiled in a test-tube, the tube can be held more conveniently with a folded strip of paper, as shown by Fig. 6, than by the various clips sold specially. Larger quantities of liquid may be boiled in thin-bottomed flasks or thin-bottomed beakers (such as that shown under the funnel in Fig. 3), placed on the sand dish. A measure for liquid divided into one hundred equal parts will be required, but the figures should commence with zero at the top, so as to show how many parts have been poured out (see Fig. 7). This tall graduated jar, if used intelligently, will give the student a very deep insight into certain easy analytical matters, and will enable him to follow quantities and proportions in a truly scientific spirit; also to perform many quantitative analyses and experiments with a practically useful degree of accuracy. The standard of graduation is not important for our present purpose, as the essential is one hundred equal parts; but it is convenient to obtain a measure graduated into 100 cubic centimeters, as this standard of fluid-measure ranges well with grain-weights for our present purpose. If graduated with figures running both ways, as shown in the sketch (Fig. 7), the burette will be useful for many purposes; the second set of figures being easily added with a writing diamond. Our single graduated burette thus becomes a rather rough and makeshift substitute for the full graduated set of the volumetric analyst.

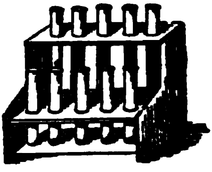


Fig. 5.

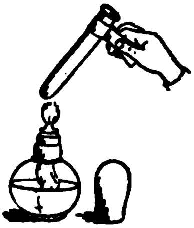


Fig. 6.

Silver Chloride. Fill the wash bottle with distilled water, or filtered rain water, and gently squirt enough water into the porcelain dish to dissolve the silver nitrate. Now pour the solution into the centigrade measure, taking care not to lose the last drop by allowing it to flow under the dish. The dish is now rinsed out with small quantities of water until all the silver salt is removed, and then the liquid in the measure is made up to the top division or zero of the scale, by carefully adding water, drop by drop, the lower part of the water curve being made to correspond with the graduation line. Mix the contents of the measure thoroughly without losing anything appreciable; this is best done by pouring backward and forward into a vessel of similar size, care being taken to drain back all traces. Now weigh out 58.5 grains of common salt; put this into a pint stoppered bottle, add 3 or 4 fluid-ounces of water and allow the salt to dissolve. Now add some of the silver nitrate solution from the measure, say about one-third. There will be a separation of a white clot-like precipitate of silver chloride. Insert the stopper, shake the bottle violently, and the precipitate will

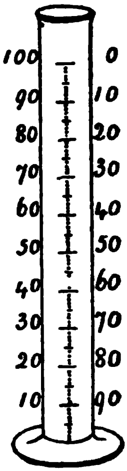
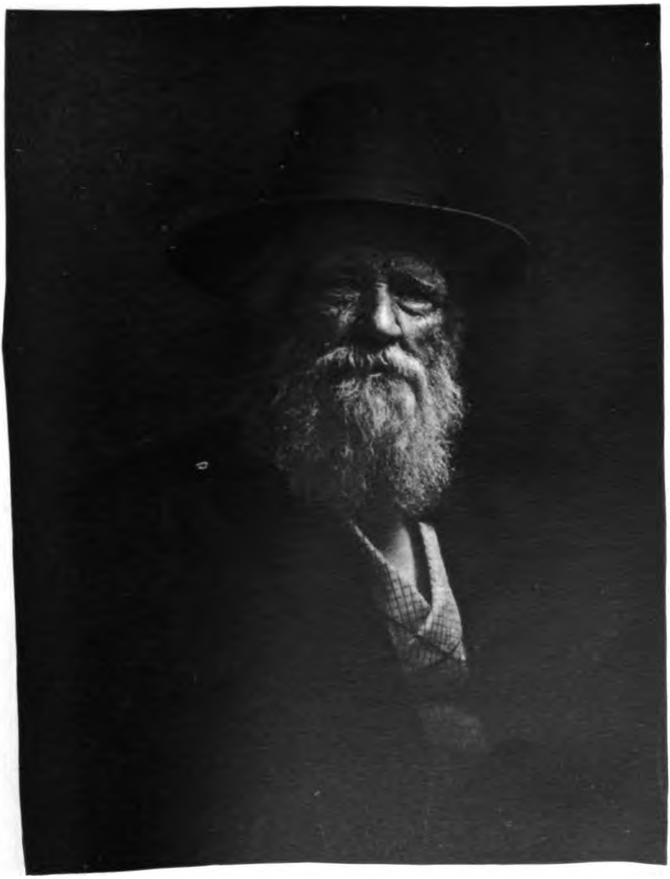


Fig. 7.



PORTRAIT
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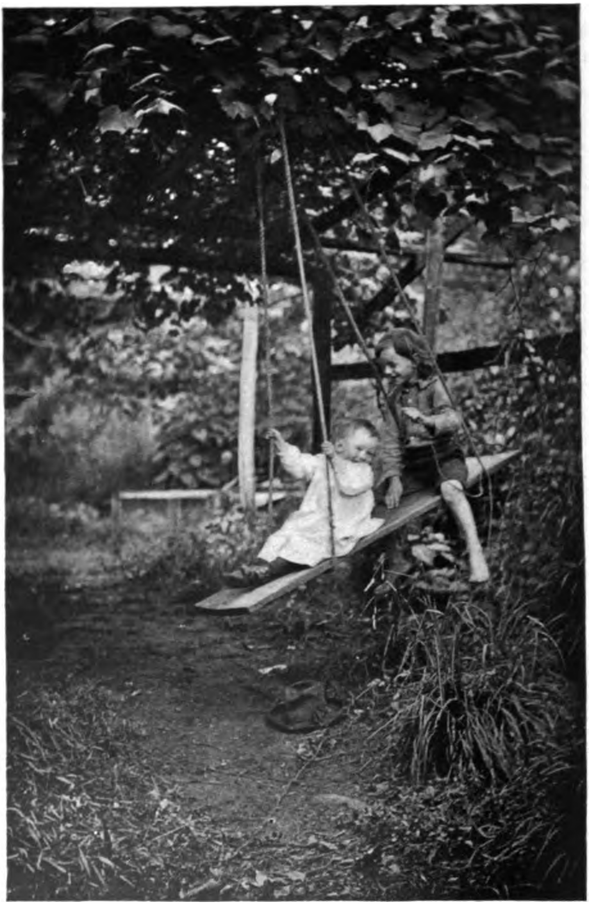
Gold Medal R. P. S. 1899



THE SWING
Henry Hall

become so far agglomerated as to settle quickly and leave a clear liquid above. Pour in a little more of the silver solution, and it will be seen that a fresh precipitation of silver chloride takes place in the clear liquid. A vigorous shaking will now agglomerate the fresh precipitate, and once more the liquid will become clear on settling. Now if what was stated in the paragraph headed "An Equation" (page 242) is correct, and if there is no experimental error or impurity of materials, it is obvious that the whole of the silver solution, or 100 measures, would be required to completely decompose the salt solution, or in other words, if the whole of the silver solution is added and the liquid is cleared by shaking, neither common salt nor nitrate of silver will remain in solution; which state of things may be proved by pouring out a few drops of the clear liquid and testing with silver nitrate; then a few drops more of the clear liquid are tested with common salt solution. Neither reagent should produce a precipitate. Probably the salt used will not be quite pure, at any rate it is likely to contain one or two per cent of moisture, and every percentage of moisture or impurity (with certain limitations) will necessitate the use of one division less of the silver solution, so the number of measures of silver solution required to reach the point where a further addition causes no fresh precipitation denotes the percentage purity of the common salt used. Thus we have a quick way of estimating the effective purity; let us assume that it is 97 per cent, or that to reach the saturation point it has been necessary to use 97 measures of the standard silver solution. We can use this impure salt to make a standard solution which in its turn may be used to test the percentage purity of commercial nitrate of silver. The equivalent weight, or 58.5 grains of the impure salt is this time to be dissolved in a little water, and made up (not to 100 measures as would be the case if the salt were pure, but) to 97 measures. Having made a small stock of this standard solution, 170 grains of commercial nitrate of silver are weighed out and dissolved. The number of measures of standard common salt solution required will give the percentage purity of that particular silver nitrate.

At this stage the student will have a firm grip of the essential principles of volumetric quantitative analysis and, what is far more important, he will be able to make solutions of silver nitrate and its precipitants in which these latter are distributed in any required relation to the silver, and by this means he will be able not only to study photo-chemical reaction from the best possible standpoint, but he will see how systematic researches as to the composition of sensitive emulsions for special purposes are carried on by chemists.

Action of Light on Chloride of Silver.

The silver chloride, obtained in the previous experiment, will not be appreciably blackened unless the work is done very slowly or in a quite bright light. Allow the chloride to settle and pour out the clear liquid; fill the bottle with distilled water, and pour out again. Then divide the liquid, in which the white silver chloride floats, into four portions by pouring it out into four saucers. To one of these add nothing, to the second add a teaspoonful of common salt, to the third, twenty or thirty grains of silver nitrate, and to the fourth add about a fluid dram of white of egg. Now set all four saucers out in the light, so that the exposure will be the same for all.

What will the reader say if I tell him that light has no action whatever on chloride of silver? Yet this appears to be the case; as, if every precaution is taken to make chloride of silver absolutely dry, it does not darken even in sunlight, but to prepare a sample of such chloride of silver and seal it in a glass tube involves somewhat complex manipulations. Although chloride of silver alone is not darkened by light, darkening will take place if there is any substance present which facilitates matters by combining with or reacting with the chlorine. Such substances (which are called sensitizers) we have in our saucers, but they react to very unequal extents. Water is a sensitizer, and the merest trace of water (such a trace as absolutely dry chloride of silver might absorb from the atmosphere by a momentary exposure to ordinary air) can sensitize the silver chloride. In the first saucer the chloride of silver has plenty of water, and the blackening will take place rather rapidly up to a certain point, when it will proceed less rapidly. If now we pour out a little of the water it will be found to redden blue litmus paper; thus showing the presence of an acid. Further, if we add a little silver nitrate to the water poured out we we shall obtain a precipitate of chloride of silver. The water, in fact, contains hydrochloric acid: the water having acted as a sensitizer by absorbing the chlorine. An equation for the action of chlorine upon water is subjoined; this reaction being facilitated by light:

$$Cl_2 + H_2O = 2HCl + O$$

Any one who has followed us this far will scarcely require any explanation: we may, however, remark that a large figure before a group of symbols such as HCl multiplies that group, while the small figure following a symbol only multiplies the value of that single symbol. Brackets may be used to extend the significance of a multiplier; thus in $(C_2H_5)_2O$ means a total of $C_4H_{10}O$.

More about Sensitizers. In the above-mentioned reaction of chlorine on water, the oxygen is probably liberated and diffuses into the atmosphere, and there is a resistance to this liberation. If to the water we add a substance which readily takes up oxygen we add another but indirect force tending to pull asunder the chloride of silver. Such a substance is albumen or white of egg, and in the dish where water and white of egg are used together, the blackening of the silver chloride will be more considerable than in the case of the plain water. The most considerable blackening will, however, take place in the case of the silver chloride immersed in water, to which silver nitrate has been added, as the silver nitrate at once attacks and absorbs any chlorine which is liberated.

Restrainers and Desensitizers. It has been seen that we may have the cumulative action of two sensitizers, as for example water and albumen, whereby increased effect is produced. We may, on the other hand add a desensitizer or restrainer to the water, and obtain a diminished effect. This was done in our experiments by adding common salt to one portion. In this case the darkening is less than when plain water is used. The soluble chlorides, bromides, and iodides are the most useful restrainers, and in air and moisture all these salts have a little indirect tendency to give up the halogen — the chlorine, bromine, or iodine. This tendency is least with chlorides, medium with bromides, and greatest with iodides. A desensitizer is more pronounced in its action than a mere restrainer as it will make a sensitive substance totally insensitive for the time being, or will sometimes undo the effect of exposure. A mixture of potassium bichromate solution with hydrochloric acid is a convenient desensitizer for silver chloride, as this mixture contains free chlorine, while water saturated with bromine or iodine (bromine water or iodine water) will serve as a desensitizer for silver bromide or silver iodide.

The Exposed Silver Chloride. Theory apart, it may be accepted as a general truth that when silver chloride, silver bromide, or silver iodide is exposed to light in the presence of a sensitizer, some of the halogen (chlorine, bromine, or iodine) leaves the silver, and what remains may either be a sub-salt (that is a salt containing more metal, Ag_2Cl, being the probable formula of sub-chloride of silver if it exists), or a mixture of the ordinary salt with metallic silver. Strange to say, we have no means of absolutely deciding between these views. Still, as an experimental fact, we can divide up blackened silver chloride into ordinary chloride and silver. This experiment, however, does not tell us whether the black material is a mixture of Ag and AgCl or whether it is a definite compound of Ag_2Cl. Allow the silver chloride in the first saucer to remain out in the light for some days until very thoroughly blackened, the water being changed now and then to remove the hydrochloric acid which is formed: this hydrochloric acid acting as a restrainer, and therefore partly balancing the sensitizing action of the water. Divide the blackened chloride of silver into two portions. Pour a little strong nitric acid on one portion, and warm the mixture in the porcelain capsule, Fig. 1, when the silver will dissolve, giving nitrate of silver in solution and white chloride of silver, which remains behind. Treat the other portions of the blackened silver chloride with a solution of hyposulphite of soda: the unaltered chloride dissolves and metallic silver remains as a still blacker powder. Thus the exposed chloride of silver appears to have two constituents which may be separated by reagents, but whether these constituents are merely mixed or chemically combined there is nothing to show.

Clear Notions of Photo-chemical Action.

The reader who has followed thus far will have a pretty clear idea of the inner chemistry of an ordinary printing-out operation, and we will now show how his knowledge of combining equivalents may enable him to plot out and experiment on the apportionment of silver salts in an emulsion. The key-note is the chemically equivalent solution, as distinguished from a solution of purely arbitrary strength.

The Use of Equivalent Solutions.

The standard already given in which the equivalent weighed out in grains and made up to a volume of 100 cubic centimetres is not selected from any abstract or academic preference, either for the grain system or for the metric system, but simply because this strength is convenient and suits the solubility of most of the material concerned in the making of sensitive silver mixtures.

The following solutions are all equivalent, volume for volume, and will serve for quickly making a wide range of trial emulsions for printing-out or development; but the material used should be pure, although in some cases

—especially in commercial work—the purity may be tested and shortcomings allowed for by volumetric determinations made in the way already indicated:

Sodium chloride . . .	58.5	grains	**Each made up to a volume of 100 c. c.**
Potassium bromide . .	119	"	
Potassium iodide . . .	166	"	
Rochelle salt	141	"	
Silver nitrate	170	"	

A More Complex Equation. Rochelle salt is a double tartrate of potassium and sodium which crystallizes with four molecules of water; its composition and its reaction with nitrate of silver are shown by the following equation:

$$KNaC_4H_4O_6, 4H_2O + 2AgNO_3 = Ag_2C_4H_4O_6 + KNO_3 + NaNO_3 + 4H_2O.$$

Those who have followed what has gone before should have no difficulty in understanding the numerical significance of the above, but we will remind the reader that the large 4 multiplies the group value H_2O, and the large 2 multiplies the group $AgNO_3$. The whole numerical value expressed by the formula of Rochelle salt is 282, but as this reacts with $2AgNO_3$, the amount of Rochelle salt equivalent to 170 of silver nitrate is half 282, or 141.

A Printing-out Emulsion. Pour into a beaker 20 c.c. of sodium chloride solution; 20 c.c. of Rochelle salt solution; and 20 c.c. of water; and add 150 grains of finely cut gelatine. When the gelatine has swelled, heat the beaker in a water bath and stir with a glass rod until the gelatine is thoroughly dissolved; now allow the temperature to fall until the mixture shows the first signs of thickening, when the requisite quantity of the silver solution is stirred in. The strictly equivalent quantity will obviously be 40 c.c., but a slight excess of silver nitrate is desirable as a sensitizer for printing-out emulsions, and to allow for this 44 c.c. may be used. The emulsion when strained through fine muslin is ready for use on paper, glass, celluloid, or other base.

The silver can be distributed in any required ratio between the chlorine of the sodium chloride and the tartaric acid of the Rochelle salt (double tartrate of potassium and sodium), by measuring out the equivalent solutions in the required proportion. If, for example, the ratio is to be one-fourth of the silver as chloride and three-fourths as tartrate (for an emulsion suited to soft negatives, tartrate giving a shortened scale of gradation), we use

10 c.c. of the sodium chloride solution and 30 c.c. of the Rochelle salt solution. Highly contrasting negatives will print better if three-fourths of the silver is as chloride and one-fourth as tartrate.

Emulsion for Development. Before treating of development it may be convenient in this place to indicate the nature of a washed emulsion for development. In 30 c.c. of potassium bromide solution and 40 c.c. of water dissolve 160 grains of hard gelatine. The silver solution is now stirred in as before but, in order to leave that excess of haloid salt which is desirable when an emulsion is intended for development, we do not take the exactly equivalent quantity (30 c.c.), but 3 c.c. less, or 27 c.c. The emulsion being now allowed to set, is cut up, washed, and further treated as directed in the text-books. The point here to be emphasized is the application of the doctrine of equivalence to the easy adjusting of the constituents of the emulsion, as explained in the case of the printing-out emulsion. If we use 30 c.c. of potassium bromide solution we shall have a highly sensitive all-bromide emulsion tending to flatness; 28 of bromide and 2 of iodide will give about equal sensitiveness, with tendency to vigor; while if we replace half or nearly half the bromide by chloride we shall have an emulsion of low sensitiveness, with much vigor and clearness; an emulsion suited for positives by development.

Physics and Chemistry of Development. All light-colored silver compounds darken on exposure if incorporated with suitable sensitizing agents, but this darkening is by no means a measure of the real sensitiveness of the compound. Silver iodide and silver bromide darken very little if exposed to light in the presence of such sensitizers as we have mentioned, or of gelatine; gelatine being the chief sensitizer in the ordinary dry plate. In spite of this, silver bromide and silver iodide are in many senses of the term far more sensitive to light than is silver chloride; but to bring this extreme sensitiveness into play an after-treatment called development is employed. We say after-treatment, but this, though usual, is not necessarily the case, as the developer may act at the time of exposure, in which case it is merely a very powerful sensitizer, a sensitizer so greedy of chlorine and oxygen that if left in contact with the silver compound for any length of time it would itself reduce or blacken the silver salt. Hence it is that we cannot usefully incorporate the developer with the material of our ordinary dry plates, as the very powerful sensitizers used for developing would blacken and reduce the silver bromide long before the exposure was made. It is an interesting fact that many—indeed most—sensitizers can act more or less *after the exposure has been made.* The sensitive silver salt must in this case be subject to the action of a weak sensitizer during exposure, and a slight decomposition is effected during the action of the light, which decomposition can be continued by the action of a very powerful sensitizer applied afterwards.

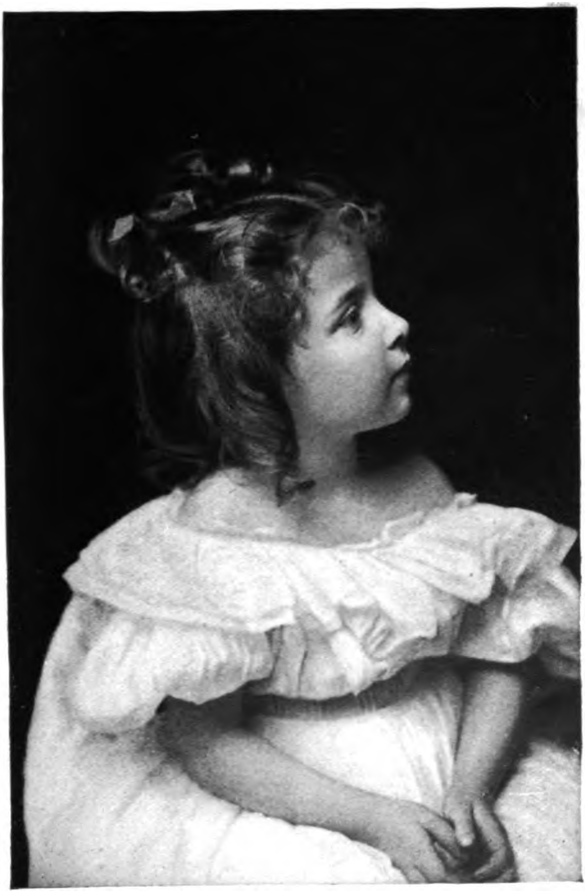
In many paths of everyday life there are instances of actions once commenced being prone to continue; but, confining ourselves to chemical examples, we may mention the burning of fuel, the souring of beer, and the rusting of iron. In all these three cases we can trace the mediate reason of this tendency to continue; although in the case of the dry plate the reason is not quite obvious; still it may be similar to that electrical action or that carrying action by which two actions conspire to quicken the rusting of iron when once started. It is perhaps better not to put forward an exact theory when there is no firm basis for the theory. It is safe, however, to hold fast to the fact. A developer is a sensitizer which acts after the exposure, but a sensitizer so powerful that it cannot be safely mixed with the sensitive body days or weeks before the exposure. Therein lies an important quality of developers, that of being easily adjustable in strength or activity to the requirements of each particular case and our earlier experiments on sensitizers give us the key to this adjustment and the reasons for it.

Developing Agents. These are legion, and to enter into a discussion of their properties would fill a book of moderate size. Pyrogallic acid, or pyrogallol, suggested as a developer 50 years ago by Liebig, may be considered a type of the organic developing agents, and for ordinary gelatino-bromide work scarce else is used than one organic developing agent or another, the action of which is strictly analogous to that of pyrogallic acid. As a representative study the pyrogallic acid developer answers all purposes. In the pure and solid state pyrogallic acid has but a moderate tendency to absorb oxygen; this being evidenced by the fact that the crystals of pyrogallic acid may be preserved unchanged for months, or even for years. In the presence of alkalies or salts which show an alkaline reaction, pyrogallic acid absorbs oxygen with extreme avidity, and the alkaline solution of pyrogallic acid, if strong, will reduce and blacken silver chloride, bromide or iodide instantly whether light has acted or not. This intense action can be modified and exactly adapted to special requirements by such expedients as adjustment of the degree of alkalinity, dilution, and the addition of restrainers. It is this power of adjustment which makes a developer manageable and useful. It is therefore necessary to understand the use of the various constituents in a developer.

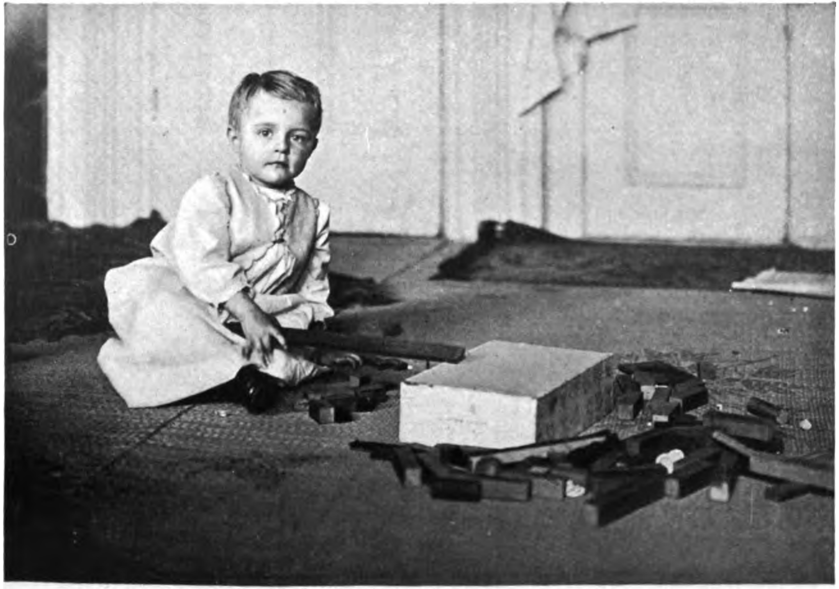
Constituents of the Developer. The pyrogallic developer, as ordinarily used, contains about one and one-fourth grains of pyrogallic acid to the fluid-ounce of water, but without an alkali this solution is practically without action on the exposed gelatino-bromide plate. An alkali which is very commonly added to the pyrogallol solution is ammonia, that is to say, pure or uncarbonated ammonia. One minim of the strong *Liquor Ammoniæ* of commerce to the fluid-ounce will be sufficient in some cases, and is always safe as a first trial; but if the image appears slowly the energizing alkali may be increased in quantity, about three minims to the ounce being a normal quantity; although in cases of under-exposure this amount may be very greatly increased—even ten-fold or more.

Restrainers. Negatives obtained with a simple pyro and ammonia developer are generally flat and somewhat fogged; consequently the developer is not ordinarily used in the form mentioned in the preceding paragraph; a restrainer, the action of which is similar to that of the common salt used in the experiment described on p. 247 being required. This restrainer may be common salt (about 3 grains to the ounce of developer for a normal exposure if the ammonia is as stated above), but it is more usual to employ bromide of potassium, about 1¼ grains to the ounce of developer. The restrainer has two functions. In the first place, it makes the action of the developer very much slower, and this allows time not only for observation, but also for timely alteration of the composition of the developer. In the second place, the restrainer tends to somewhat undo the effect of light on the sensitive surface, but the undoing or desensitizing action is most considerable in the case of the lighter tints, consequently a brighter or more contrasting negative is obtained.

In cases of extreme over-exposure the proportion of potassium bromide may reach 20 grains to the ounce of developer, or the plate may be soaked in a 10 per cent solution of potassium bromide for some minutes before development. A dipping bath containing a 10 per cent solution of potassium bromide is very convenient to have



By Henry H. Pierce



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at hand, as when a plate shows the first signs of extreme over-exposure it may often be saved by being quickly immersed in the bromide bath, where it is allowed to remain for a few minutes before continuing development.

All soluble chlorides, bromides, and iodides act as restrainers, and in a less marked sense alkaline citrates and sodium sulphite act as restrainers; but although this latter salt acts as a restrainer in the sense that it makes the action of the developer rather slower than it would otherwise be, and it prevents fog by acting on the least exposed parts, its use does not necessitate a longer exposure than would be necessary if it were not used. Three specific actions of sulphite which render it of special value are mentioned in another paragraph.

Defects of Pyro-Ammonia Developer.

The defects and the special merits of the pyro-ammonia are due to the same cause—the very slight or incipient solubility of the silver haloids in the dilute ammonia used. This favors completeness and delicacy of reaction; but chloride of silver is very much more soluble in ammonia than is bromide of silver or iodide of silver, and as the solution of chloride of silver in ammonia is readily reduced by gelatine, which is partially decomposed by long heating, we often get a general deposit of fine transparent silver (green fog or dichroic fog), if plates containing a trace of chloride and partly decomposed gelatine are developed with the pyro-ammonia developer. Even with silver bromide only, and the gelatine in the best possible condition, there is a trace of stain or fog from the reduction of the dissolved silver; hence pyro-ammonia is not well suited for developing prints on paper; moreover, most emulsions used for paper contain much chloride and are totally unsuited for development by pyro-ammonia. Another characteristic of pyro is that brown oxidation products of the developer add themselves to the image and not only tone it but give a stain-like fineness; at least for that portion of the image due to pyro.

The Use of Sulphites.

Sulphite of soda (or the potash salt may be used) may, as before stated, entirely or partially replace the restraining bromide in the pyrogallic developer. The sulphite of soda also acts, to a certain extent, as a solvent of silver haloids and thus assists in the developing action. The dissolved haloid does not, under these circumstances, act on the gelatine and produce stain. The reason is that ammonia has a specific softening action on gelatine which favors reaction, while the strong sulphite solution tends to withdraw water from the gelatine and so make it hard and compact; many strong saline solutions also have this property. Another very important function of the sulphite solution is that it acts as an absorbent of free oxygen, thus protecting the pyrogallic acid from oxidation. More has been claimed for it in this respect but probably without sufficient reason.

Caustic Alkali or Carbonates. Caustic alkali always attacks and softens the gelatine film, hence, speaking generally, caustic alkalies are undesirable, especially as it is difficult to exactly gauge their strength owing to the absorption of carbonic acid from the air. Carbonated alkalies, on the other hand, tend a little the other way, and for normal work they energize the developing agent fully as well as it is energized by caustic alkalies; still the quantity of carbonate used may be many times as much as would be required were the alkali in the caustic state, hence it becomes quite impossible to increase the quantity in the same ratio as the ammonia can be increased in the pyro-ammonia developer. When exposures are normal—or anywhere near normal—the carbonate developers are as good and indeed better than the caustic developers. A normal pyro-sulphite-carbonate developer is the following: Water, 1 ounce; pyrogallic acid, 2 grains; crystallized sulphite of soda, 65 grains; crystallized carbonate of soda (washing soda), 30 grains. A glance will show that when our ounce of fluid is so loaded with solid matter we cannot vary it by increase of the energizing alkali tenfold, as may be done in the case of the pyro-ammonia developer. The variations most useful are the following: (1) Dilution with water to make the action slower; another expedient of the same nature being to soak the plate in water before development. (2) Doubling the amount of pyro, which tends to a vigorous and dense image, and to rapid action generally. (3) Bromide may be added to restrain, and the carbonate of soda may be increased to nearly double; but this latter variation makes comparatively little difference in the results.

Preservatives in the Developer. Made-up developers, from their nature, must be liable to deterioration by the absorption of oxygen. Of fully made-up developers, those containing a large proportion of sodium sulphite are the most stable for a reason already stated (p. 253). The most frequent way of using a preservative is to make up the oxidizable constituent of the developer with the preservative. These preservatives are often acids, and these by their nature act preservatively on those organic substances which, like pyro, only become powerful reducers in the presence of alkalies. When an acid is thus used in one constituent solution of the developer, sufficient alkali must be employed in the other solution not only to neutralize the acid but also to leave the necessary excess of alkali. The acids commonly used are nitric acid, citric acid, sulphurous acid, and the acid salt bisulphite of potassium. Alcohol, glycerine, and sugar act as preservatives against oxidations in a way which is not well understood, but of which we have many examples outside photographic experience. Such preservatives as these tend to make the developer a little sluggish in its action, hence alcohol and glycerine are weak retarders, although not restrainers in the sense that soluble chlorides and bromides are restrainers as already explained.

Fixing the Negative or Print. The one fixing agent which is now almost universally used is the so-called hyposulphite of soda, a salt which Sir John Herschel (1819) recognized as a solvent of silver chloride; but it was first used for fixing photographs by the Rev. J. B. Reade in 1837. Reade thus produced the first really fixed silver photographs; these being negatives obtained on paper by the use of gallic acid in conjunction with nitrate of silver.

Hyposulphite of soda has the composition of sulphite of soda, plus one atom of sulphur, and it may be obtained by boiling a solution of sulphite of soda with sulphur:

$$Na_2SO_3 + S = Na_2S_2O_3.$$

When a silver haloid salt dissolves in a solution of hyposulphite of soda, a double silver and sodium hypophosphite is formed, this salt having the composition $AgNaS_2O_3$. Assuming the silver haloid to be silver chloride, the reaction is as follows:

$$AgCl + Na_2S_2O_3 = NaCl + AgNaS_2O_3.$$

This salt is only formed and is only stable in the presence of a considerable excess of the sodium hyposulphite, and if the fixing solution is weak a small proportion of a nearly insoluble double salt, $Ag_2Na_4(S_2O_3)_3$, is formed, and some of this is very liable to remain in the film, where it slowly decomposes and dark sulphite of silver is formed. It sometimes happens that a print which has been fixed in an insufficient quantity of strong "hypo" solution will be immersed in the washing water while almost saturated with the double salt $AgNaS_2O_3$. Under these circumstances a trace of the insoluble double salt $Ag_2Na_4(S_2O_3)_3$

may be formed and deposited on the fibers of the paper or in the gelatine of the film. Hence it is important to use a large quantity of strong and fresh "hypo" in fixing; and it is an excellent precaution to immerse the negative or print for a few minutes in a fresh bath. The weak "hypo" bath, anything weaker than the usual 1 to 5, is a somewhat risky thing, although 1 to 10, or even weaker, is often used for prints. Thorough fixation in a strong bath (1 to 5), and plenty of it, is a great security against fading, and more prints fade or become yellow by reason of imperfect fixation than from insufficient washing; still the washing should be thorough in all cases.

The Acid Fixing Bath. If we add sulphuric acid or any strong acid to "hypo" there is undoubtedly a liberation of the true hyposulphurous acid $H_2S_2O_3$, but this splits up into sulphurous acid and free sulphur,

$$H_2S_2O_3 = H_2SO_3 + S.$$

The addition of any strong acid to "hypo" tends to liberate hyposulphurous acid, and the decomposition of a trace of hyposulphurous acid may sulphurize a negative or print and sow the seeds of destruction. At the same time it is an established fact that a "hypo" bath so acidified as to contain free sulphurous acid will often clear away brown stains and give brighter negatives than can be obtained by the use of a plain "hypo" bath. A safe medium course appears to be in the addition of sulphurous acid as bisulphite of soda, and in this case there is probably no fear of sulphurizing. The following is satisfactory and probably quite safe: Hyposulphite of soda, 4 ounces; bisulphite of soda, 1 ounce; water, 20 ounces.

Hyposulphite or Thio-sulphate. In spite of the fact that, according to analogy and general usage, the term hyposulphite is consistent, there are many chemists who apply the term thio-sulphates to the hyposulphites of the photographer, and some confusion may arise from this practice. To make matters worse, those chemists who use the term thiosulphates apply the term hyposulphites to a different class of salts, salts corresponding to the acid $H_2S_2O_4$. There appears to be no remedy for this and other cases of confusion as regards names, as every writer on scientific subjects can use whatever names he pleases.

Physical Development. If we mix a solution of nitrate of silver with a reducing agent and a restrainer, the constituents of the solution can be so adjusted that there is no immediate precipitation of silver, but the solution will have a tendency to deposit silver. If such a solution is allowed to act on any silver photograph the silver will tend to deposit on the existing image and will intensify it. Here we have an example of the tendency of masses of similar matter to attract similar matter and grow or increase in size; a familiar illustration being afforded by the growth of crystals, as for example when water freezes and long needles of ice grow on the surface. Not only the black or dark visible image will thus attract silver from a solution ready to deposit it, but the latent or undeveloped image will similarly attract silver, and on this principle the Talbotype process and the wet collodion process are based.

Intensifying and Toning Platinotypes with Gold. The principle of physical development has been applied by Mr. Dollond to the toning of platinotypes, the prints being treated with a mixture of glycerine and neutral chloride of gold. Under these circumstances gold becomes reduced, and at the moment of its liberation it adheres to the platinum image.

Ordinary Toning with Gold. Many of the ordinary gold-toning solutions are in such a balanced condition that the gold is on the point of depositing, as is evidenced by the purple deposit of gold which forms on the sides of the containing vessel, and indicated sometimes by the reddish tint of the solution which shows the presence of soluble or colloid gold. Such baths tone largely by the simple deposition of the metallic gold on the silver image; the silver image attracting the gold just as the platinum image attracts the gold in Mr. Dollond's process, mentioned above. Another action takes place in which the silver reacts with the chloride of gold and causes the deposition of the gold on the image. New toning baths generally contain trichloride of gold, while old toning baths are more likely to contain a monochloride of gold. The reactions are probably as follows:

$$AuCl_3 + 3Ag = 3AgCl + Au$$

and

$$AuCl + Ag = AgCl + Au.$$

Borax, acetate of soda, and carbonate of soda, will slowly remove the chlorine from dilute solutions of gold chloride and bring it to the stage at which gold is deposited on the inside of the containing vessel. This deposition is, however, reduced to a minimum if the vessel is kept in the dark and in a cool place. For this reason photographers usually keep their toning baths away from direct light when not in use.

The Toned Image Printed-out or by Development. The metal forming the developed image is ordinarily much more solid than that formed by printing out; the complete granule of sensitive salt being generally reduced to the metallic state by the action of the developer. In the case of the printed-out image only a portion of the granule is reduced, this reduced part forming a kind of metallic sponge, which is left when the bulk of the granule is removed by the solvent action of the fixing salt. Hence it is that developed prints are usually more permanent than printed-out prints; and another factor making for the superior permanency of the developed prints in that each granule is firmly imbedded in the original matrix of gelatine or other medium, while in the case of the printed-out image the metal sponge may contract and be no longer firmly imbedded. That the printed-out image should tone more readily is easy to understand and, when quite thoroughly toned with gold or platinum, the printed-out image may be highly satisfactory on the score of permanency, but "thorough" toning in the sense of a complete replacement of the silver is scarcely practicable.

This "thorough" toning is more usually attempted with platinum than with gold. Even if every ordinary precaution is taken, a little silver is likely to remain as cover to the granules, and the presence of the platinum will render the silver very liable to change, because the two metals form a galvanic couple. The silver is likely to first absorb sulphur, forming silver sulphide; this next absorbs oxygen forming silver sulphate, and this salt diffuses through the paper, causing a stain or tint, while the original image is lowered by the loss of the silver. Hence it is that platinum-toned silver prints have a rather bad reputation as compared with pure platinum prints as obtained by Willis' process.

The True Platinum Print. Without going into any details of Willis' platinotype process and its various modifications, the true platinum print may be described as an iron print toned with platinum. The sensitive material is a ferric salt or a per-salt of iron. Light converts this salt into a ferrous salt, which in its turn acts on platinous chloride, taking away the chlorine and replacing the ferrous image by a fine deposit of platinum. All traces of the original iron are now readily removed by hydrochloric acid, leaving an image of pure platinum unrivaled as regards permanence.

The Toned Platinum Print. The true and pure image of platinum obtained on paper by Willis' method, as mentioned in the last paragraph, may be coated or toned by many methods which are of the nature of physical development (see p. 256); one of these methods in which the platinum image is toned or intensified with gold having already been mentioned. This method of coating or toning with gold has many advantages. Various tints of blue-black may be obtained and a faint image may be intensified; the new additions being probably as stable as the original image. Other toning or intensifying methods by physical development or accretion have been recommended, and even silver has been deposited on the true platinum image to strengthen it. Such a combination is even worse than the silver image imperfectly converted into a platinum image by toning, as the silver is on the outside and is specially liable to change as already described (p. 258). Physical toning with iron or uranium ferrocyanides (deposited from the ferricyanide solution) has been advocated in connection with platinotypes, but in some few cases secondary reactions appear to have taken place by which the uranium or iron compound has spread. However this may be, such toned platinotypes have gained the bad name which combinations of silver and platinum seem really and undoubtedly to merit. In none of these changes does the true platinum image suffer. A "hypo" bath will remove spread silver, and successive treatment with caustic potash and hydrochloric acid will remove the iron or uranium.

Only Notions; not a Complete System. Disappointment has awaited the reader who has expected a text-book of instruction in general chemistry or an encyclopedic treatise on the chemical reactions involved in photographic practice. To have attempted either in so short a space would have resulted in a crowd of highly technical sentences so concise as to be totally unintelligible to the ordinary reader. One connected chain of notions, extending right along the most frequented photographic path, has been laid down, and it is hoped that the reader will miss no link of the chain — especially those links in which the laws of definite proportion are touched upon.

THOMAS BOLAS.

BOOKS.

Among the many books dealing with technical chemistry which the photographer may profitably keep at hand for reference, I mention here a few which I have found useful:

Chemistry for Photographers. By C. F. Townsend. A good first text-book with a very full index. 158 pp. Second edition. 1899 (Eng.). 50 cents.

The Chemistry of Photography. By W. Jerome Harrison. 425 pp. 1892. $3.00. This is perhaps the most complete work available on photographic chemistry.

The Chemistry of Photography. By R. Meldola. 382 pp. 1889. A series of lectures dealing with photographic chemistry in a more advanced way than the foregoing. $2.00.

A Manual of Photographic Chemistry. By T. F. Hardwich. 384 pp. 1886. $2.00. This was for years the standard book on the subject. The edition here listed was revised by J. Traill Taylor, but it is now somewhat behind the times.

The First Principles of Photography. By Clement J. Leaper. 264 pp. 1892. $2.50. Although a general text-book, this contains many chapters devoted to the chemistry of photography, and is written for self-instruction throughout.

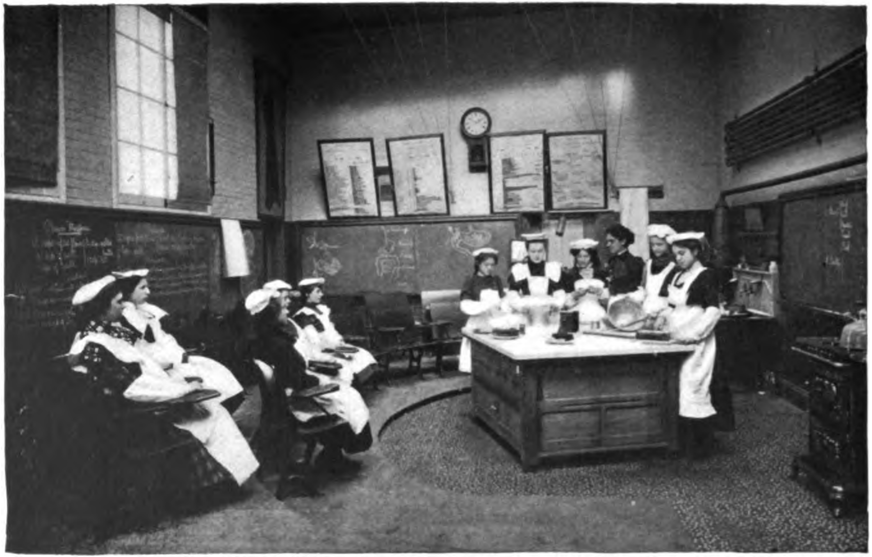
The Arithmetic of Chemistry. A simple treatment of the subject of Chemical Calculations. By John Waddell. 130 pp. 1899. $1.00.

Lessons in Elementary Chemistry. By Sir H. E. Roscoe. 5th edition. Revised to 1896. 503 pp. $1.25.

These last two mentioned are works on general chemistry, and contain no special reference to photography.

APPENDICES.

On the following pages will be found a *Table of Seventy-four Elements* with their Atomic Weights and Chemical Symbols, and a *Table of Chemical Formulæ and Equivalence.* Other tabular matter required by the student, such as tables for the conversion of thermometric degrees, of specific gravity of liquids, weights and measures, etc., may be found in almost any photographic year book.



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APPENDIX I

A TABLE OF ATOMIC WEIGHTS OF SEVENTY-FOUR ELEMENTS

By T. W. RICHARDS, in the *American Chemical Journal*

NAME	Symbol	Atomic Weigh
Aluminum	Al	27.1
Antimony	Sb	120.0
Argon	A	39.9?
Arsenic	As	75.0
Barium	Ba	137.43
Beryllium	Be=Gl	9.1
Bismuth	Bi	208.0
Boron	B	10.95
Bromine	Br	79.955
Cadmium	Cd	112.3
Cæsium	Cs	132.9
Calcium	Ca	40.0
Carbon	C	12.001
Cerium	Ce	140.0
Chlorine	Cl	35.455
Chromium	Cr	52.14
Cobalt	Co	59.00
Columbium	Cb=Nb	94.0
Copper	Cu	63.60
'Didymium'	Nd+Pr	142 ±
Erbium	Er	166.0
Fluorine	F	19.05
Gadolinium	Gd	156.0?
Gallium	Ga	70.0
Germanium	Ge	72.5
Glucinum	Gl=Be	9.1
Gold	Au	197.3
Helium	He	4.0?
Hydrogen	H	1.0075
Indium	In	114.0
Iodine	I	126.85
Iridium	Ir	193.0
Iron	Fe	56.0
Lanthanum	La	138.5
Lead	Pb	206.92
Lithium	Li	7.03
Magnesium	Mg	24.36

A TABLE OF ATOMIC WEIGHTS — continued

Name	Symbol	Atomic Weight
Manganese	Mn	55.02
Mercury	Hg	200.0
Molybdenum	Mo	96.0
Neodymium	Nd	143.6
Nickel	Ni	58.70
Niobium	Nb=Cb	94.0
Nitrogen	N	14.045
Osmium	Os	190.8
Oxygen (Standard)	O	16.000
Palladium	Pd	106.5
Phosphorus	P	31.0
Platinum	Pt	195.2
Potassium	K	39.140
Praseodymium	Pr	140.5
Rhodium	Rh	103.0
Rubidium	Rb	85.44
Ruthenium	Ru	101.7
Samarium	Sm	150.0
Scandium	Sc	44.0
Selenium	Se	79.0
Silicon	Si	28.4
Silver	Ag	107.93
Sodium	Na	23.050
Strontium	Sr	87.68
Sulphur	S	32.065
Tantalum	Ta	183.0
Tellurium	Te	127.5
Terbium	Tb	160.0
Thallium	Tl	204.15
Thorium	Th	233.0
Thulium	Tu	170.0?
Tin	Sn	119.0
Titanium	Ti	48.17
Tungsten	W	184.4
Uranium	U	240.0
Vanadium	V	51.4
Ytterbium	Yb	173.0
Yttrium	Yt	89.0
Zinc	Zn	65.40
Zirconium	Zr	90.5

APPENDIX II

TABLE OF CHEMICAL FORMULÆ AND EQUIVALENCE

Note.—When the valency of a metal or acid radical is greater than one, the salt will generally react with a number of molecules of silver nitrate corresponding to the valency. The practical bearing of this is expressed numerically in the fourth column.

	Formula	Molecular Weight	Amount which precipitates 170 ozs. of Silver Nitrate
Acid, Acetic	$HC_2H_3O_2$	60	
" Boracic or Boric	H_3BO_3	62	
" Citric	$H_3C_6H_5O_7,H_2O$	210	70
" Formic	$HCHO_2$	46	
" Gallic	$HC_7H_5O_5$	170	
" Hydrobromic	HBr	81	
" Hydrochloric	HCl	36.5	
" Nitric	HNO_3	63	
" Oxalic (cryst.)	$H_2C_2O_4,2H_2O$	126	63
" Pyrogallic	$H_3C_6H_3O_3$	126	
" Salicylic	$HC_7H_5O_3$	138	
" Sulphuric	H_2SO_4	98	
" Sulphurous	H_2SO_3	82	
" Tannic	$H_4C_{27}H_{18}O_{17}$	618	
" Tartaric	$H_4C_4H_2O_6$	150	75
Alcohol	C_2H_5HO	46	
Alum (cryst.)	$Al_2(SO_4)_3K_2SO_4,24H_2O$	948	
" Chrome (cryst.)	$Cr_2(SO_4)_3K_2SO_4.24H_2O$	999	
Ammonia	NH_3	17	
Ammonium Bichromate	$(NH_4)_2Cr_2O_7$	253	126
" Bromide	NH_4Br	98	98
" Carbonate (normal)	$(NH_4)_2CO_3$	96	
" Chloride	NH_4Cl	53.5	53.5
" Iodide	NH_4I	145	145
" Nitrate	NH_4NO_3	80	
" Hydrosulphate	NH_4HS	51	
" Sulphocyanide	NH_4CNS	76	
Barium Bromide	$BaBr_2$	297	148
" Chloride (cryst.)	$BaCl_2, 2H_2O$	244	
" Iodide	BaI_2	391	195
" Nitrate	$Ba(NO_3)_2$	261	
Cadmium Bromide (cryst.)	$CdBr_24H_2O$	344	172
" Chloride	$CdCl_2$	183	91.5
" Iodide	CdI_2	366	183

TABLE OF CHEMICAL FORMULÆ — continued

	Formula	Molecular Weight	Amount which precipitates 170 ozs. of Silver Nitrate
Calcium Bromide (cryst.)	$CaBr_24H_2O$	272	136
" Carbonate	$CaCo_3$	100	
" Chloride (dry)	$CaCl_2$	111	55.5
" Iodide	CaI_2	294	147
Copper Acetate (cryst.)	$Cu(C_2H_3O_2)_2H_2O$	199	
" Bromide	$CuBr_2$	223	111
" Chloride	$CuCl_2H_2O$	171	85
" Sulphate	$CuSO_45H_2O$	249	
Glycerine	$C_3H_5(HO)_3$	92	
Gold Perchloride	$AuCl_3$	302.5	
Hydroquinone	C_6H_42HO	110	
Hydroxylamine Chloride	NH_3OHCl	69.5	
Iron Chloride (ferrous)	$FeCl_2$	127	
" " (ferric)	Fe_2Cl_6	325	
" Citrate	$Fe_3(C_6H_5O_7)_2$	598	
" Iodide	FeI_2	310	
" Nitrate (cryst.)	$Fe(NO_3)_26H_2O$	288	
" Oxalate (ferrous)	FeC_2O_4	144	
" " (ferric)	$Fe_2(C_2O_4)_3$	376	
" Sulphate (ferrous; cryst.)	$FeSO_4,7H_2O$	278	
" " (ferric)	$Fe_2(SO_4)_3$	400	
" Ammonia Sulphate (cryst.)	$FeSO_4,(NH_4)_2SO_46H_2O$	392	
Lead Acetate (cryst.)	$Pb(C_2H_3O_2)_23H_2O$	379	
" Iodide	PbI_2	460	
" Nitrate	$Pb(NO_3)_2$	331	
" Oxide	PbO	223	
Lithium Bromide	$LiBr$	87	87
" Chloride	$LiCl$	42.5	42.5
" Iodide	LiI	134	134
Magnesium Bromide	$MgBr$	184	
" Chloride	$MgCl_2$	95	47.5
" Iodide	MgI_2	278	189
" Sulphate (cryst.)	$MgSO_47H_2O$	246	
Mercury Chloride (mercuric)	$HgCl_2$	271	
" " (mercurous)	$HgCl$	235.5	
" Cyanide	$HgCy_2$	252	
" Iodide (mercuric)	HgI_2	454	
" " (mercurous)	HgI	327	

TABLE OF CHEMICAL FORMULÆ — continued

	Formula	Molecular Weight	Amount which precipitates 170 ozs. of Silver Nitrate
Platinum Chloride	$PtCl_4$	339	
Potassium Bicarbonate	$KHCO_3$	100	
" Bichromate	$K_2Cr_2O_7$	294	
" Bromide	KBr	119	119
" Carbonate	K_2CO_3	138	
" Chlorate	$KClO_3$	122.5	
" Chloride	KCl	74.5	
" Chloro-platinite	$PtCl_2(KCl)_2$	414	
" Citrate (cryst.)	$K_3C_6H_5O_7H_2O$	324.3	
" Cyanide	KCN	65	
" Ferricyanide	$K_6Fe_2C_{12}N_{12}$	658	
" Ferrocyanide (cryst.)	$K_4FeC_6N_63H_2O$	422	
" Hydrate	KHO	56	
" Iodide	KI	166	166
" Nitrate	KNO_3	101	
" Permanganate	$K_2M_2O_8$	316	
" Sulphocyanide	$KCNS$	97	
Silver Acetate	$AgC_2H_3O_2$	167	
" Bromide	$AgBr$	188	
" Carbonate	Ag_2CO_3	276	
" Chloride	$AgCl$	143.5	
" Citrate	$Ag_3C_6H_5O_7$	513	
" Fluoride	$AgFl$	127	
" Iodide	AgI	235	
" Nitrate	$AgNO_3$	170	
" Nitrite	$AgNO_2$	154	
" Oxalate	$Ag_2C_2O_4$	304	
" Oxide	Ag_2O	232	
" Sulphide	Ag_2S	248	
Sodium Acetate (cryst.)	$NaC_2H_3O_2,6H_2O$	190	
" Biborate (Borax)	$Na_2B_4O_710H_2O$	382	
" Bromide	$NaBr$	103	103
" Bicarbonate	$NaHCO_3$	84	
" Carbonate (cryst.)*	$Na_2CO_3 10H_2O$	286	
" Chloride	$NaCl$	58.5	58 5
" Citrate (dry)	$Na_3C_6H_5O_7$	258	86

*This is the ordinary washing soda. Other hydrates are known.

TABLE OF CHEMICAL FORMULÆ — continued

	Formula	Molecular Weight	Amount which precipitates 170 ozs. of Silver Nitrate
Sodium Hydrate	$NaHO$	40	
" Hyposulphite (cryst.)	$Na_2S_2O_3 5H_2O$	248	
" Iodide	NaI	150	150
" Nitrate	$NaNO_3$	85	
" Phosphate [The ordinary commercial crystallized salt, disodium hydrogen ortho-phosphate]	$Na_2HPO_4,12H_2O$	358	119
Sodium Sulphate	$Na_2SO_4 10H_2O$	322	
" Sulphite (cryst.)	$Na_2SO_3 7H_2O$	252	
" Potassium Tartrate [Rochelle Salt.]	$NaKC_4H_4O_6,4H_2O$	282	141
Strontium Bromide	$SrBr_2 6H_2O$	355.5	177
" Chloride	$SrCl_2 6H_2O$	266.5	133
" Nitrate	$Sr(NO_3)_2$	211.5	
Tin Chloride (Stannic)	$SnCl_4$	260	
" " (Stannous)	$SnCl_2 2H_2O$	225	
Uranium Bromide (cryst.)	$UBr_4 8H_2O$	704	
" Nitrate (cryst.)	$UO_2(NO_3)_2 6H_2O$	504	
" Sulphate (cryst.)	$UO_2(SO_4)3H_2O$	422	
Zinc Bromide	$ZnBr_2$	225	112
" Chloride	$ZnCl_2$	136	68
" Iodide	ZnI_2	319	159
" Nitrate (cryst.)	$Zn(NO_3)_2 6H_2O$	189	
" Sulphate (cryst.)	$ZnSO_4,7H_2O$	287	

NOTES.

The reprint (6th thousand) of THE PHOTO-MINIATURE, No. 5: *Stereoscopic Photography* is now ready. It is the most useful résumé of the principles and practice of stereoscopy available for the American or English reader, and those interested in the subject will do well to put a copy of the little book upon their shelves. No. 11: *Developers and Development* is also reprinting, the second edition of this, 5,000 copies, being as large as the first edition.

Among the numbers to be published during the next few months some very attractive subjects will be dealt with by men who know whereof they speak. These will be announced as soon as the various monographs are in hand.

◆

What seems likely to be, for some years to come, a a standard book of reference on *Photography in Colors* has just appeared. It is published on this side by E. and H. T. Anthony & Co., and in London by Marion & Co. The work is concerned with principles and methods, rather than practical working data of the various processes described, and is divided into three sections. The first section by Mr. Thomas Bolas traces the historical development of heliochromy, giving a general survey of the processes, and a method of obtaining heliochromes on silver chloride papers and by the gum-bichromate and ferro-prussiate processes combined. The second section, by Alexander A. K. Tallent, describes the work of Abney, Ives, Joly, and Wood in detail; and section three is devoted to Lippman's process of interference heliochromy, the account being written by Mr. Edgar Senior.

There have been many calls for just such a book as this, and we are of the opinion that the information it gives will fully satisfy even the enthusiast in matters of color-photography. Price $2.12.

◆

It is difficult to obtain authentic information concerning the awards made at the Paris Exposition, and the so-called official list has apparently been compiled by some one utterly unfitted for the task. As far as we can determine, the following is a complete list of the awards made to American exhibitors in the photographic section:

Grand Prize.—The Eastman Kodak Co., Rochester.

Gold Medal.—Max Levy, Philadelphia; C. E. Bolles, New York; Curtis & Cameron, Boston; Baker Art Gallery, Columbus, Ohio; Bausch & Lomb Opt. Co., Rochester.

Silver Medal.—Louis E. Levy, Philadelphia; Taber Photographic Co., San Francisco; George Steckel and Frank G. Schumacher, Los Angeles; American Aristotype Co., Jamestown; W. N. Brenner, Cincinnati; Geo. R. Lawrence, Chicago; F. A. Rinehart, Denver; Nepera Chemical Co., New York; Joseph Byron, New York; Burton Photo Co., New York.

Bronze Medal.—Photo Materials Co., Rochester, and Manhattan Optical Co., Creskill, N. J.

According to this showing, American photography was not properly represented at the exposition, either from the artistic, commercial, or industrial standpoint. We note from a statement in *Photography* that 815 awards were made in the photographic section. Of these, 407 went to French exhibitors, 73 to British exhibitors, and 36 to exhibitors from the United States.

◆

The advantage of "backed" as compared with "unbacked" plates for almost all classes of photographic work are now generally recognized. For those who prefer to "back" their own plates we know if no better "backing" mixture than *E. W. N. Improved Non-Halation Backing*, prepared by Edward W. Newcomb, New York. Mr. Newcomb has for years advocated the backed plate, in season and out of season; and has given much thought and experiment to the composition of a backing mixture which could properly be called ideal. A circular of information, written in Newcomb's inimitable style, tells all about his mixture better than any words of ours. We have used *E. W. N.* backing with complete satisfaction, and hope to use more. It is different from any other mixture of the sort and better from every point of view; easily applied, effective, and easily removed. It prevents halation, helps in the securing of the blue and purple tones, and in obtaining a clean brilliant negative. What more could be desired in a backing?

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Mr. Thomas Manly, the inventor of the Ozotype process, writes that the business is making good progress in Great Britain, but that no arrangements have yet been made for the sale of Ozotype supplies in America. There is a chance here for some enterprising dealer. Who will take it up? We have had many inquiries concerning these supplies, but can only refer inquirers to Mr. Manly, 1 Weedington Road, Kentish Town, London, N. W.; or to his manual on the process, price 50 cents.

◆

We are advised that *The Index of Standard Photograms*, listing several millions of photographs available for reproduction by publishers and others, will be ready at an early date. The book, which is being put through press by Dawbarn & Ward, Ltd., London, has run up to 600 pages, and the subscription price is $6 per copy. The American demand will be supplied by Tennant & Ward, N. Y.

◆

The following notes on photography in Germany are taken from the current number of *The Photographic Dealer:*

An important invention is about to be placed on the German market by Messrs. Höchheimer & Co., of Munich. It is in the shape of a new rubber photographic printing process, which it is believed will be found superior to other productions of this description.

The latest AGFA novelty is in the form of a reducer. Most of the ordinary solutions which are concocted for the purpose of lowering the tone of negatives have, it is hardly necessary to state, very poor keeping qualities. Moreover, the process of mixing the various ingredients is generally a somewhat tedious one. The AGFA reducer, however, is notable for its great durability, readiness and ease with which it may be used. To prepare a reducing bath, it is only necessary to dissolve a portion of it in ten times the same quantity of water. It is put up in neat little 100-gr. glasses, with a screw top and hollow stopper, which can be employed as a measure; and it may also be had in 10-gr. glass tubes. The cost is low.

An article that will doubtless commend itself to most photographers, and is therefore deserving of the special attention of dealers, is a new case for holding photographs which has been brought out by Herr Carl Saun, of Dresden, A. It is intended to take the place—especially in professional photographers' reception rooms—of the ordinary album, and is certainly a far more useful con-

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trivance than the latter, for the pictures it contains may be removed, rearranged, and replaced without the slightest difficulty.

Another novelty of recent introduction is the "Victoria Special Platino" matt bromide paper. This comes from the well-known Frankfort firm of Haake & Albers, and is specially to be recommended for enlargements. It gives excellent pictures, with a beautiful velvety surface, clear shadows, and a very fine black tone.

Much alarm has been caused among the dry plate manufacturers of the Fatherland by the proposal of the German government to increase the tax on glass. It is naturally thought that such an increase would be most injurious in its effect upon the traders in question; and one is not surprised to learn that the "Verband Deutscher Trocken-Platten-Fabrikation" resolved at a recent meeting to do its utmost to prevent the rise.

◆

Mr. Otto Sichel, a prominent London dealer, spent a few days with us after his trip to the Milwaukee convention last month. His impressions of photography in America were altogether favorable, and he expressed particular pleasure in the very high quality of American professional portraiture. Mr. Sichel has a wide acquaintance among the principal British and continental photographers, and it was interesting to hear his comment that the new Falk studio, at the Waldorf-Astoria, New York, is ahead of anything of the kind on the other side.

◆

Mr. Aloys Werner, a New York professional photographer, and an expert worker in carbon and platinotypy, has perfected a new printing paper with remarkable qualities. As far as we can learn (the process of manufacture being secret), it is a pigment paper giving a visible image during printing. The specimen prints we have seen, made on plate paper direct without mounting, are superb, and combine the qualities of carbon, platinum, and photogravure. We hope to add to this information later.

◆

The Spectrum Plate: Theory, Practice, and Result. A pamphlet reprinted from "Photography." 8 pp. Illustrated. Published by Iliffe Sons & Sturmey, Ltd., London. No price given.

Since the publication of THE PHOTO-MINIATURE, No. 6: *Orthochromatic Photography*, we have had several

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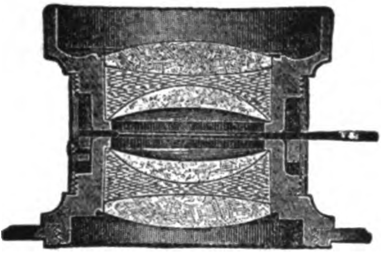

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inquiries regarding the *Spectrum* plate and system of photographing colored objects therein mentioned. This pamphlet, originally a lecture given by Miss Ackland before an English camera club, is as complete a demonstration of the *Spectrum* plate and its uses as could be desired.

◆

Total Eclipses of the Sun. By Mabel Loomis Todd. A new and revised edition, with an introduction by Professor David P. Todd, Director of the Observatory at Amherst College. 273 pp. Illustrated. 4½ x 7¾ in. Cloth, $1. Boston: Little, Brown & Co.

The recent total eclipse of the sun awakened a new interest in astronomical photography among amateur photographers, and we have latterly received frequent requests for information of a book giving the photographic results secured during previous eclipses. To these inquirers, and to all interested in this fascinating application of photography, Mrs. Todd's *Total Eclipses of the Sun* may be recommended as at once the best and most delightful book on the subject. The new edition here noticed contains considerable matter, both text and illustrations, not included in the first edition. It is intended, not for the astronomer or the expert in celestial photography, but for the amateur who seeks information stripped of technical verbiage and put into an interesting form.

◆

Chemisches Wörterbuch. By Dr. Carl Rothe. 192 pp. 5¾ x 9 in. Price 6 marks ($1.45). Published by Karl Schwier, Weimar, Germany.

For readers of German, who have occasional use for a dictionary of materials used in various branches of chemistry, photography, laboratory work, etc., this work will prove invaluable. It gives, in brief form, the name, properties, chemical symbol, price, etc., of all known substances used in chemical manipulations, and is the most complete work of the kind within our knowledge.

◆

Here is a typical "American photographic item" such as our brethren of the English photographic press delight to place before their readers: "We were much interested in reading in one of the American journals of a horse belonging to Mr. Sullivan, of Salina, Kansas. The animal has in its right eye a perfect photo of Mrs. Sullivan. This is accounted for by the veterinary surgeons,

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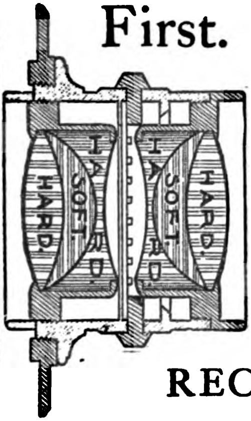

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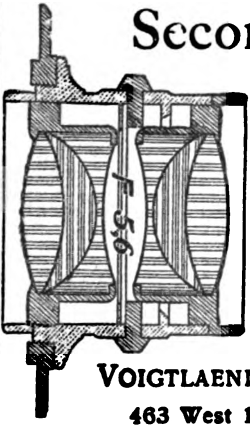

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by the fact that Mrs. Sullivan stood before the horse during an electrical storm. Curiously enough the sight is not injured, and Mr. Sullivan was offered 500 dols. for the animal, but he will not part with it."

◆

The business of Messrs. Riley Bros., lantern slides and cinematograph supplies, 16 Beekman St., New York, and Bradford, England, has been converted into a limited liability company under the style of "Riley Bros." The capital of the new concern is stated at $50,000, in $5 shares.

◆

Writing in the *Photographic News*, Mr. E. J. Wall says, concerning the "new pictorial movement" in photography:

For some years, or at least four or five, we have been fed by certain writers on photography with a particular pabulum which, whilst it has been generally accepted, has of late been served with such a strong sauce of personal advertisement that it has become nauseating, and signs are not wanting to show that the feverish wave of the high and new art is beginning to subside. One or two writers in England have bravely penned what others have thought, and there is a strong movement now in America against the new art craze. Last month in *Wilson's Photographic Magazine* a temperate, well thought-out article on what the writer termed "The Cult of the Godlings," a phrase, by-the-bye, which threatens to become a classic in photographic circles, showed how the wind was blowing, and now Abraham Bogardus, one of the veteran workers and writers, says: "The writer has kept quiet as long as possible in regard to the claims of some writers on photography, in which they say that the work of amateurs is superior to that of the professional. This claim is all nonsense, and is not true. There are amateurs who make good work, but the majority make very ordinary work. Writers may call it new art. There is neither art nor workmanship about much of it. Place such work beside the regular every day work of well-known professionals and it can only be contrasted, not compared."

The love of the eccentric and the craving for notoriety have undoubtedly led many astray, and not only negatives but prints, smutty, blurred, badly lighted, and with an almost entire absence of focus, have been the prevailing fashion; but we hope the pendulum will swing back again in time. We do not think it matters much whether

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the man be amateur or professional; it is the general tendency of his work that one has to look at, and which has to be considered; and it is a very open question whether the present high-art photograph is going to hold its own, particularly in the larger world of art.

* * *

Dr. Eder has recently published as a separate monograph his researches in the effects of various intensifiers and the hypo and ferricyanide reducer. We give his conclusions as of interest to those who have seen THE PHOTO-MINIATURE dealing with this subject:

Sensitometer numbers, 0.3 meter light distance	Opacity of the gelatino bromide plate before and after intensification and reduction						
	Opacity of the untreated negative	Slightly intensified with mercuric chloride and sodium sulphite	1. Fully bleached with mercuric bromide			Normally reduced with hypo and ferricyanide	Strongly reduced with hypo and ferricyanide
			2. Blackened with sodium sulphite	3. Blackened with ammonia	4. Blackened with amidol developer		
11	....	....	0.16	0.15	0.22	....	....
10	0.15	0.2	0.19	0.22	0.27	....	....
9	0.21	0.24	0.27	0.33	0.35	0.13	....
8	0.27	0.35	0.42	0.52	0.47	0.18	....
7	0.38	0.55	0.59	0.71	0.65	0.29	0.17
6	0.51	0.78	0.72	0.90	0.83	0.36	0 23
5	0.66	0.95	1.02	1.30	1.01	0.53	0.38
4	0.81	1.25	1.31	1.56	1.26	0.70	0.50
3	0.91	1.50	1.61	1.92	1.57	0.85	0.60
2	1.05	1.70	1.38	2.35	1.84	1.00	0.75
1	1.19	1.91	2.25	3.00	2.12	1.15	0.85
a	1.43	2.12	2.70	quite opaque	2.60	1.30	0.96
b	1.55	2.30	3.00		3.00	0.37	1.06
c	1.65	2.70	quite opaque		opaque	1.47	1.20

1. The mercury intensifier was: mercuric chloride, 2 parts; potassium bromide, 2 parts; water, 100 parts.
2. A ten per cent solution of sodium sulphite was used.
3. Ammonia diluted with 10–20 parts water.
4. Amidol, 2 parts; sodium sulphite, 20 parts; water, 500 parts.

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An interesting appreciation of Miss Eva Lawrence Watson, of Philadelphia, illustrated by many examples of her work, appears in *Brush and Pencil* (Chicago, 25 cents), for September.

◆

The effect of wall papers and hangings on the general illumination of rooms, including photographic studios, is well shown by the following table from *Photo-Wochenblatt*, which gives the percentage of white light reflected from surfaces of various textures and colors: Black velvet, 0.4; black cloth, 1.2; black paper, 4.5. Other papers as follows: dark blue, 6.5; dark green, 10.1; bright red, 16.2; dark yellow, 20.0; bright blue, 30.0; bright yellow, 40.0; bright green, 46.5; bright orange, 54.8; white, 70.0; whilst mirror glass reflects 92.3 per cent. These numbers relate to the *visual* effect. With orange paper the photographic effect is relatively much smaller, whilst with bright blue paper it is relatively much higher. The best relation between general illumination and photographic effect seems to be obtained when the walls are pale grey, with a bluish tinge.

◆

How the Mafeking One-Pound Notes Were Made is the title of an unusually interesting article (illustrated) in *Photography* for August 30. The basis of the paper is an interview with Mr. E. J. Ross, an amateur photographer in Mafeking during the famous siege. The note was designed by Colonel Baden-Powell, and the actual notes issued were blue print copies of the design, countersigned by authority.

◆

A new lens by Goerz, of Berlin, is described in a late issue of *Photo-Wochenblatt*. We quote the free translation given in *Photography*. The lens, which is known as the "Hypergon Doppel Anastigmat," differs from its predecessors by including the enormous angle of 140 degrees. In other words, it can be used with a plate, the longest side of which is four times the focal length of the lens. The lens of three and a half inches focus will cover a fifteen-twelve plate if well stopped down, or with a larger aperture a twelve-ten plate. The lens is said to be an almost spherical periscope, completely anastigmatic. As with other lenses of the same class, the image must be focused with an aperture not very different from that with which the exposure is to be made. As might be expected with a lens embracing

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so wide an angle, the falling off in the illumination toward the corners of the plate is very marked indeed, but we are given to understand that the makers have devised a special form of diaphragm with a view to getting over this difficulty. We shall await with very great interest the opportunity of making a thorough trial of this lens. It will render practicable photography which, without it, has been impossible; and when used at its widest angle should afford some excellent object lessons upon the possibilities of photographic perspective.

◆

The exhibit of the Eastman Kodak Company at the Paris Exposition was awarded the only Grand Prize secured by any American photographic manufacturer. The cablegram announcing the award caused much jubilation in Rochester on its arrival, the Grand Prize being the highest award in the gift of the Exposition authorities.

◆

George Murphy, 57 East 9th St., New York, announces several specialties worth attention. Among these are the new mounts *Clinto*, *Rembrandt*, *Artello*, *Guido*, *Myco*, *Alto*, and *Bengaline*. A sample of each of these, with price-list and description of the tints, can be had for sixteen cents in stamps. A lantern slide maker's outfit, comprising two trimmers and twelve metal guides, which sells for one dollar, is another attractive novelty for the lantern slide season. The *Eagle Photo Trimmers*, straight and revolving, are also things which will be useful in the amateur's workroom.

◆

"As a live and successful body, the California Camera Club is second to none." This was one of the first lines of copy penned for "The Photo-Miniature Notes," and though crowded out of No. 1, it appeared in *The Pose in Portraiture*. The California Camera Club is typical of its city and its state, and it is a matter for little wonder but much congratulation that the Pacific coast is to have its first Salon.

Our earliest definite information comes in *Camera Craft* to the effect that the California Camera Club and the Directors of the Mark Hopkins Institute are coöperating in the matter. The Salon will probably be opened in January next, and will last two weeks, but more detailed particulars are as yet unarranged.

Those who have followed the course of photography on the Pacific coast—and indeed throughout the West—will

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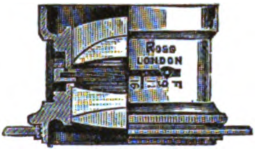

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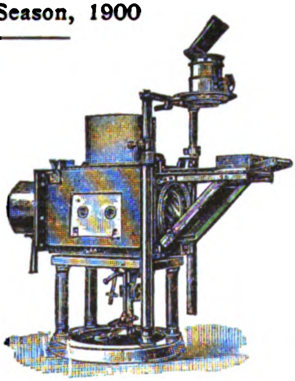

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look forward with much interest to this exhibition. Its business success is a foregone conclusion, for San Francisco is a unique city in the matter of enthusiastic hard work; and if a representative collection of the best western work can be got together it will have a value national rather than "sectional." The western work is characterized by strength and virility, founded on a sound appreciation of technique, and its worth will be widely acknowledged when it is more widely known.

❧

The frontispiece of this number has a melancholy interest in that it is perhaps the best-known work of my first master in photography, William McLiesh, of Darlington, England, who passed away some few weeks ago, rich in years and honor. Despite every care in its reproduction, the engraving does not do justice to the rare beauty and delicacy of the original, which excited wide comment and admiration when first exhibited at London and Brussells in 1882. The picture, which practically made Mr. McLiesh's fame as a photographer, was made on the banks of the Wear, where the river winds around the peninsula on which stand Durham Cathedral and the Castle—in the heart of the old city of Durham. It may be fairly said to have been the first successful attempt to secure the pictorial effects peculiar to landscapes seen through mist.

William McLiesh was a photographer of unusual skill and attainment in many branches of his art. In large, direct portraiture, genre, figure work, and landscape, his works secured medals and remarkable prices wherever they were exhibited. The years I spent with him are among the happiest of my memories, and all who served with me under his leadership will mourn the passing of one who was equally lovable as master, man, and friend. *Requiescat in pace.*—J. A. T.

❧

The Lovell Dry Plate Mfg. Co., New Rochelle, N. Y., asks us to announce the following awards made in the recent Lovell Plate competition: *First prize*, $25, not awarded. *Second prize*, $20, Curtis Bell, 558 Fifth Ave., New York. *Second special prize*, $20, Henry Hall, Dougan Hills, N. Y. *Third prize*, $10, not awarded. Six prizes of $5 each to W. A. Boger, 254 Skillman St., Brooklyn; G. Lehr, 1388 Bushwick Av., Brooklyn; G. L. LaPorte, M.D., 52 West 114 St., N. Y.; W. M. Miner, 418 Broome St., N. Y.; John Meaney, 45 West 99th St.,

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The competition was open to all users of Lovell plates in New York City; the prints sent in were somewhat uneven in quality but high in average. The judges were Messrs. Chas. H. Davis, Henry Wenzel, Jr., and John A. Tennant. Further competitions are to be announced later.

* * *

Mr. Chas. H. Loeber, 12 East 17th Street, New York, has just published a Bargain List of second hand and shop-worn cameras and lenses which offers some genuine bargains. A copy of this list may be had on application to Mr. Loeber. Readers who have perhaps looked in vain for a trade printer who will give them good platinum prints from their selected negatives, will be interested to know that Mr. Loeber makes a specialty of high-class platinum printing for amateurs and professionals. Willis & Clements' paper, only, is used in this work, and the prices are very reasonable for the quality of the work shown to us.

* * *

The American Annual of Photography for 1901, edited by Juan C. Abel, is promised for October 1. Judging by the advance sheets of the book, the *Annual* will be an unusually interesting volume, pictorially and otherwise. Among the contributors are Joseph T. Keiley, with "An Essay on the Universality of Photography and Its Application to the Various Requirements of Mankind;" Henry Wenzel, Jr., on the gum-bichromate process, "A Complete and Practical Contribution on Its Working;" Newton W. Emmens, on "Orthochromatic Photography," and others equally prominent in special lines. To tabulate the illustrators of the *Annual* would be simply to make a list of the principal pictorial workers of the day. In short, it is a wonderfully attractive book and should enjoy a big sale.

* * *

Two new platinum papers, *Perfecter* and *Artisti*, are being introduced by the Camera Chemical Co., Denver, Col. We expect to have something to say of these in our next number, after a practical trial of their quality. Meanwhile, two points may interest our readers. First, *Artisti* is offered at 25 cents per dozen, 4 x 5 in.; and, second, the booklets announcing the papers, *Sunshine and Shade*, and *Portraiture in Platinum*, are well worth sending for, each

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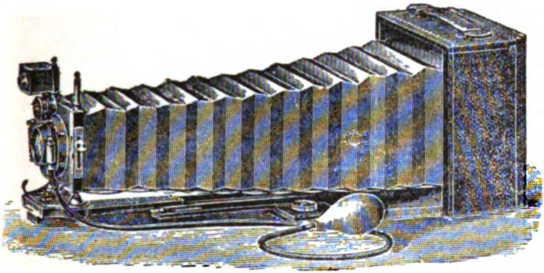

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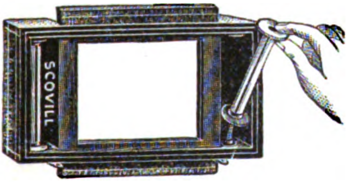

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* * *

The New England convention, held at Copley Hall, Boston, September 12, 13, and 14, under the presidency of Henry H. Pierce, of Providence, was a jolly as well as a very profitable affair to all who attended. The number of photographers present, including all worthy of mention in the New England states, must have been fully 300; and the exhibition comprised an unusually interesting collection of work from all over the United States. The addresses given at the meetings were of a practical character, and were listened to with much interest. The lectures on Art and its Application in Portraiture, by Darius Cobb and T. Hovey Allen, were altogether enjoyable, and the criticism of pictures taken from the walls, given by Mr. Allen, brought out many useful and instructive lessons.

It is, of coure, impossible in these pages to give a full account of the affair. The report may, however, be seen in *The Photo Era* for October and *Wilson's Magazine*. Among the pictorial exhibits which we recall as possessing merit of a high order, may be mentioned three portraits of women by Hy. Histed of New York; two panel portraits of women by B. J. Falk, New York; a delightful group of children by E. B. Core, New York; two large heads, boldly lighted and noticeable for breadth of treatment, by Pirie MacDonald, Albany, N. Y.; a varied collection of portraits, including heads, figures, window effects, and subjects introducing candle-light effects, all managed in a masterly fashion, by Henry H. Pierce, Providence, R. I.; three portraits strong in their painter-quality and remarkably clever in general handling by Geo. H. VanNorman, Springfield, Mass.; two genres by Chas. W. Hearn, of Boston, decidedly the best work we have yet seen from Mr. Hearn; four dainty vignettes or sketches in platinotype by Eva Gamble Walborn, of Akron, Ohio (a pupil of Minns); a few well-considered examples of pictorial portraiture by W. H. Partridge, of Boston; a capital figure-study by J. C. Strauss, St. Louis; three pictures of children by C. R. Reeves, Anderson, Ind.; and a half-dozen striking poses by F. Geissler (Robinson Studio), and Will Armstrong (Conly Studio), both of Boston. In this hurried glance at the exhibits, doubtless some pictures worthy of praise are passed over; but it was an exhibition over which one could spend hours in study and comment. The exhibit of Mr. C. A. Johnstone, of Hartford, Conn., for instance, brought forward

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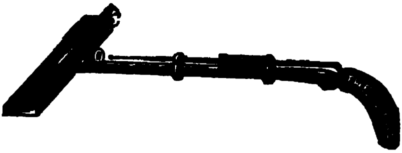

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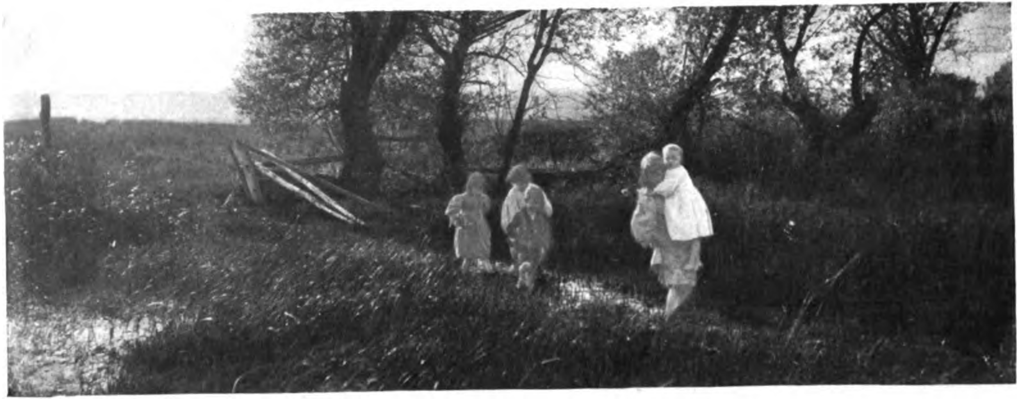
a comparatively new man from whom great things may be expected. His miniature portraits were full of delicacy and feeling combined with fine technique. Mr. Geo. E. Tingley's pictures, also deserve extended notice. They included several outdoor compositions exhibiting qualities rarely found in photographs. We hope to present some of them in future numbers of THE PHOTO-MINIATURE. The *Salon*, into which were gathered what were considered to be the best of the exhibits, was a collection equal to anything we have seen at the national conventions—a show which did honor to American portraiture at its best.

Mr. Geo. H. VanNorman, of Springfield, Mass., was elected to serve as president of the Association for 1901, an admirable choice among many good men.

Among the manufacturers and dealers present, we noted Mr. C. S. Abbott and T. Pattison of the American Aristotype Co.; Mr. John Carbutt of Philadelphia; Mr. Bromley, representing George Murphy, New York; and Mr. Somerville, representing The G. Cramer Dry Plate Co. The local dealers, Horgan, Robey & Co., Andrew J. Lloyd & Co., and B. French & Co. were also represented by members of the firms. The American Aristotype Co. had a fine display of photographs on its various papers, including a life-size portrait (the largest direct portrait ever made) by Geo. Lawrence, of Chicago, printed on *Aristo-Platino* from a negative made on a Seed plate. Carbutt's *Vinco* development paper, in all its varieties, was also represented by an attractive display which secured much attention.

We hope to give further particulars in our next number. The convention, looked at as a whole, was a big event—bigger, in fact, than we can handle in the space at our disposal as we close for press. President Pierce and his associate officers, C. W. Hearn, H. A. Collings, Geo. H. VanNorman, A. P. Wyatt, C. A. Johnstone, W. G. C. Kimball, and W. C. King deserve high praise for the result of their year's hard work for the success of the affair.



INNOCENTS ABROAD
George E. Tingley

THE PHOTO-MINIATURE

A Magazine of Photographic Information

EDITED BY JOHN A. TENNANT

Vol. II OCTOBER, 1900 No. 19

PHOTOGRAPHING CHILDREN.

Is it not strange that, among all the books dealing with photography, we have no guide to that most delightful of pictorial fields — the photographing of children? The child in its cradle, or in its mother's arms; children at play in the home, or abroad in field or garden, with all the paraphernalia of mimic life which belongs to childhood; the child tracing the big A B C of her first alphabet, or setting out the droll procession of animals for the Noah's Ark; the boy absorbed in the fascination of the spinning top — what chances for picture-making! All these, with the thousand and one themes which arise at the very thought of childhood, make up a wonderful world, wherein story-tellers and poets, painters and photographers have worked in divers ways for the delight of children of a larger growth. And yet, of the magic part played by camera and lens in this great world of child-life no man hath ventured to make a book; so that we have pictures in abundance, but little or no information about their making.

Perhaps it is not so strange, after all, this lack of written counsel concerning an art which is as difficult as it is fascinating. In literature and painting the worker is comparatively free. They are impressionistic fields at best. But in photography we are bound and hampered by a hundred limitations. There are so many things we cannot more than attempt. And in counting up the results, there are so many failures and so few successes. For my own part, I can readily understand why those skilled in child portraiture should shrink from any description of their methods, thinking of these, when successful, as happy issues of momentary genius and circumstance, rather than as formulæ likely to be of use to their fellow-workers. For truly it is a field which tries the temper of those who venture into it, and one in which many ambitious spirits have failed, despite careful preparation and elaborateness of equipment. So full of pleasure is the work, however, and so strong is the world's desire for pictures of the little ones, that children have ever been, and always will be, the most familiar of the photographer's subjects—be he amateur or professional.

Wherefore, in answer to requests oft repeated, and because I am, myself, a lover of children, photographically and every other wise, I propose to gather into these pages what experience and observation have told me, and what I have learned from others more skilled than myself, concerning the photographing of children at home, in the studio, and out-of-doors.

The subject is, of course, as inexhaustible in its scope as in the variety of its interest, and therefore beyond more than suggestive treatment in any *little* book made in haste, to be repented at leisure. But this is fully understood before we begin. And, since we are to discuss an undertaking so elusive that no two workers can agree touching the best way to go about it, it may be well to remind the reader of a plain fact tersely put by one who was himself prolific in experiment and formulæ; viz., that "all formulæ are indicative and not imperative!"

A New Art. Until within the past few years—practically until the coming of the rapid dry-plate and quick-working lens—child portraiture remained completely within the recognized sphere of professional photography. That the professional failed to take advantage of his golden opportunity is abundantly recorded in the family photograph album, now so carefully stored away among the "hidden treasures" of every home. In the course of time, modern photography and the amateur came to the rescue, awakening the professional to a keen appreciation of things before undreamt of in his photographic philosophy. Since which awakening we have had pictures of children such as painters and poets alike failed to give us, full of the roguish grace and abandon of childhood in all its innumerable moods, replete with the charm and illusion of life of its happiest phase.

The First Lesson. The great lesson which the professional worker had to learn from the amateur is the first and most important of the lessons to be learned here, *to wit:* that children should be pictured as children, and not as little folk masquerading in all the seriousness of grown-ups. Those who will compare Henry Hall's "The Swing," given in the last number of THE PHOTO-MINIATURE, or the two children looking at the mechanical doll, in this number, with the average portrait of a child dated in the sixties, will grasp the significance of this lesson. And yet the professional worker of 1865 had the experience of a quarter of a century in photography at his elbow. Oh! the wasted years! What joy the world has lost because this elementary lesson was completely overlooked!

Children as Camera Subjects. In taking up the photographing of children—whether as a home hobby or as a business specialty—our little subjects themselves must have careful consideration before actual camera work can be attempted with any reasonable hope of success. You cannot take children as part of the day's work. First and last we must abandon the matter-of-fact point of view which we have acquired as one of the penalties of age, and cultivate the habit of looking at things as children look at them. While we are with them the things which interest, or surprise, or please them must awaken at least a semblance of the same emotions in ourselves, and the wisdom of our years should be restricted to the direction of the mental and physical activities of our subjects toward the end we have in view. There is joy in all this if we go about it in the right spirit, but we must beware of too much "make believe" or "bluff" in our fraternity with children. They have a wonderful understanding of fellowship, and their absolute simplicity possesses deeper subtlety than we can always recognize. Then there are two or three essentials which must be covered. We must have a big love for childhood, and all things pertaining thereto—especially a familiar knowledge of its habits and desires. Next we must remember that children are abnormally sensitive to the influence of environment or locality. And we must learn to possess our souls in patience, without which, indeed, it were folly to approach the work we have in hand. Apart from these things we need an abundance of light, a rapid lens, quick plates, and a reasonable knowledge of photographic manipulation, for often our work must be done quickly and skilfully, and in strange corners as well as under conditions not always to our liking.

Child-Love. The necessity of a love for children in all who have to work with them is well understood, but it is less generally applied (or shall I say more clumsily applied?) in photography than one would suppose. The tactless, matter-of-fact way in which children are handled in many studios, for instance, is the easiest road to failure, and its result is seen in the average professional portrait of a child. It is hardly too much to say that unless one has a natural and strong liking for children one should refrain from any attempt to make pictures of them by photography. Fortunately this love for children is the most natural thing in the world.

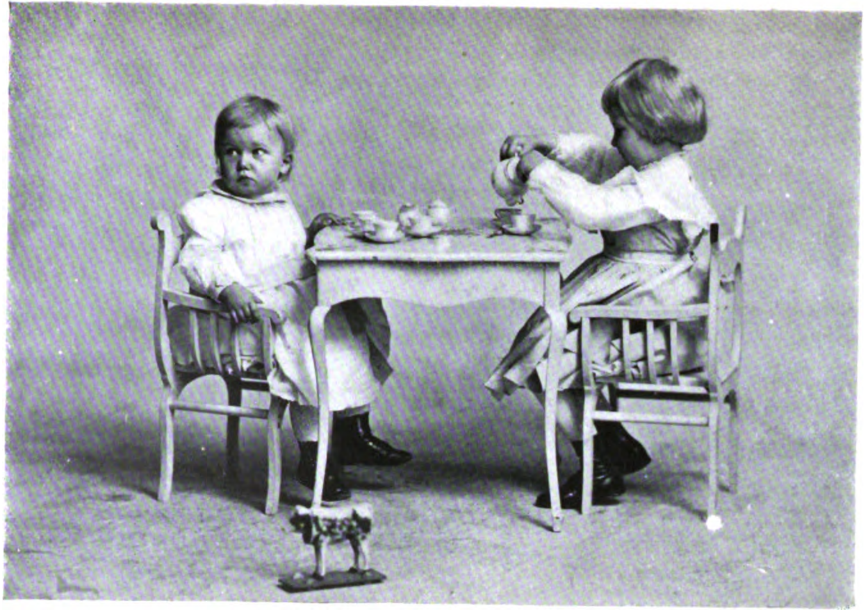
Once gain the confidence of children, and we may do with them, or get them to do, whatever we may desire. But the confidence must come first. As a general thing it is freely given to all who show a spirit of kindliness and sincere affection—to which children are peculiarly responsive. This should not be forgotten when we are asked to photograph children with whom we have had no previous acquaintance. In such cases let the camera be put aside and a little time given to "making friends." Many very interesting children are exceedingly shy at the first meeting, but if the camerist is of the right sort their reserve melts like snow before an April sun, and they open out into the most willing and delightful of subjects.

"Making Friends."

It has been well said that children are born with a sixth sense, fully developed, which very promptly tells them whether the man with the camera "fits" or not. On this intuitive perception they build their intercourse with the stranger, showing him reserve, shyness, interest or opposition, according to their keen appreciation of the inwardness of men and things. Those who seek to make pictures of children, therefore, must cultivate a love for them and seek by constant observation to become familiar with their ways and whims, how to approach them, and by what wiles to win and hold their interest and good will.

In keeping with all this, wherever we find a photographer more than usually successful with children, such as Core, Rockwood, Spaight, Byrne, and R. W. Robinson, we find men who possess the happy faculty of quickly winning the affection of children, and who have acquired the habit of quietly "sizing up" their little subjects, so that the first few minutes of the sitting (the time of most importance in professional work) shall make for success when the studio is reached.

Because of this all-important kindliness, women are peculiarly successful as photographers of children, being rich in that love for and knowledge of childhood which lead direct to the hearts of children. Of the ways by which well-known women photographers, such as Mrs. Käsebier, Miss Watson, the Misses Selby and many others, secure their charming pictures of children, little, unfortunately, can be said. A woman's way hath ever



By E. B. Core

By E. B. Core

By W. H. Partridge

By W. M. Hollinger

been past finding out, and beyond analysis when she, herself, graciously explains it! That it consists of a magic winningness, a blending of simple affection and womanly tact, conveys the substance of the method but hardly helps us over the difficulties. When a mere man, naturally clumsy and awkward in such affairs, turns himself "with malice aforethought" to so delicate a task, we may perhaps learn something by observing his methods. But this we will take up when we consider children in the studio.

The Influence of Environment. There are few influences to which children are more sensitive than to the influence of locality or environment. This is a detail which intimately concerns photographing children, but it has never received the consideration its importance deserves. Let us think it over. Children are interesting wherever we find them, but nowhere so interesting as they are at home. Home is the natural playground of the child—the one place with whose nooks and corners he is quite familiar; the only place where he is free to be himself, with all his faults and graces. At home the inordinate curiosity about everything in sight, characteristic of the child in health, has already been satisfied when we come to deal with him, and in his every-day environment there is no room for that reserve, timidity or shyness which influences him so strongly amid new or unfamiliar surroundings. At the studio the strangeness of the place and of the things about him awakens these undesirable moods, making success difficult to attain under conditions otherwise favorable. Herein the reader will perceive that, for our purpose, the photographer's studio, so far from being desirable, is oftentimes a huge mistake, and that the amateur has in this detail a big advantage over the professional worker. Thus for pictures of children as we enjoy them in daily life, it may fairly be said that the golden opportunities fall to the amateur rather than to the professional. As a matter of course, where the studio is equipped to simulate the environment of the home, and in those rare instances where the photographer has mastered the gentle art of making friends of his little visitors, these objections do not apply. Nay, more; where these conditions are fulfilled the photographer, favored by his better facilities from the technical standpoint, can more easily produce pleasing pictures than the skilled amateur hampered by lack of these aids. But for the general variety of children's pictures, wherein we want to see our little folk as they busy themselves in their own familiar world, the home is altogether the most desirable of places wherein to picture them. And the amateur, working in the home, has the big advantage of choice of opportunity with abundance of time for the work.

Having thus obtained a preliminary survey of the field, let us get down to the actual work, beginning with the children at home or about the house.

The Choice of a Camera. In the matter of apparatus our needs are simple. For those who are fortunate a rigid "field" camera of the square bellows variety, a rapid lens or anastigmat with noiseless shutter working within the camera, a plentiful supply of plate-holders and a sensible tripod make up the ideal outfit. Where these aids of the most desirable sort are not available, it is simply a matter of doing our best with what we have at hand. Among hand-cameras the twin-lens or reflex variety is undoubtedly the most useful, enabling one to follow the movements of our subject right up to the moment of exposure. Much of the beautiful work which brought fame to the late Robert Faulkner was secured by a camera of this sort. It consisted of a double or twin camera, with two lenses accurately paired, arranged in such a way that the subject was focused upon the ground-glass with one lens, and upon the sensitive plate with the other, so that all alterations of the swing-back, or raising or lowering of the figure in the picture space were made in both cameras simultaneously and equally. With such an arrangement he could (after the first simple arrangement of the subject) watch the image on the focusing screen, leaving the child or group to its own devices, and make the exposure at any moment when the pose and expression were most desirable. Those who have bewailed the many delightful pictures lost forever by the few seconds' delay, necessitated by inserting the plate-holder and drawing the slide after focusing, will appreciate the practical advantages of such an instrument. Good work, however, can be made with an ordinary box or hand-camera fitted with a rectilinear lens working at *f*/8, such as can be bought for $15 or thereabouts, and I have seen many delightful bits of child-life secured with a hand-camera which cost less than $10. With "fixed focus" cameras, whose lenses usually have *f*/16 or *f*/20 as their largest working aperture, the chances of success when working indoors with restless subjects are, of course, minimized. Here we must depend upon other favorable circumstances, such as a bright morning, skill in the use of camera, and more skill in the dark-room. Many things ordinarily pronounced impossible can be done with a little contrivance.

Outdoors the fixed-focus or other hand-camera fitted with roller-films suggests itself as best adapted for our purpose. With such an instrument the very attitude of the child is caught—at its play, and in every position and condition. I prefer for myself a fixed-focus box, which does not require opening to be used. Those who acquire skill to accurately judge distance and to get a plate-holder in, slide drawn and shutter set in the half of the twinkling of an eye, will prefer a focusing camera and dry plates; but the bright groups are generally made on films, and with some form of fixed-focus snap-shot box. I keep a mental list of the pictures I intend to have in the halcyon time when I shall have the yet unoffered camera which will make, without focusing, successful exposures in shady places at a speed of say one-fiftieth of a second. *Then* I will have those happy little Italian youngsters dancing to a hand-organ orchestra in New York's "Little Italy" of a bright summer Saturday morning; *then* I will get the ideal newsboy scrap scenes in Frankfort street, and all the quaint bits of child-life which make the "sidewalks of New York" so variously interesting to those who have eyes to see.

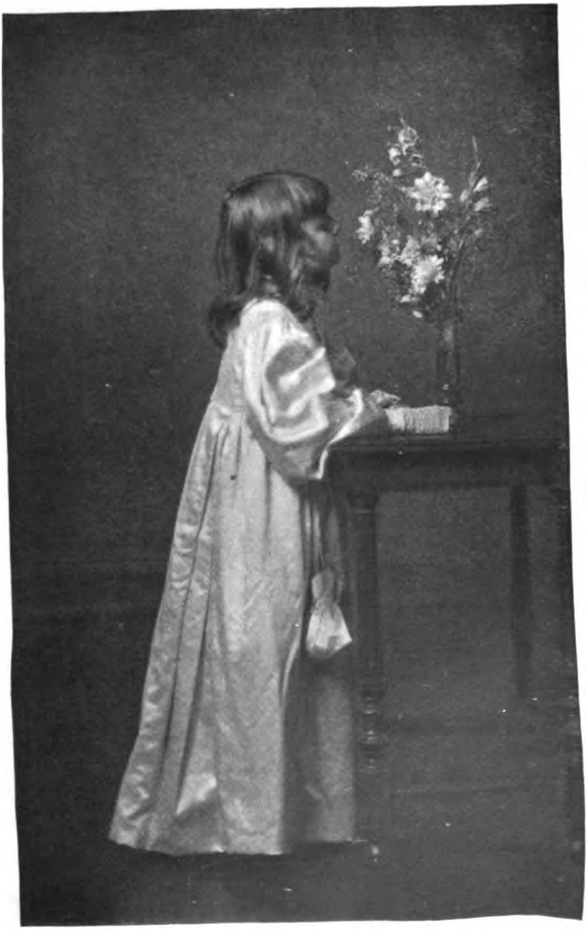
But with the easily available apparatus of the day, and a judgment tempered by dark-room experience, the loving worker will get life and motion on the film. The hint he needs first, is to keep his figures relatively in the same plane, avoiding the violent perspective of the short-focus lens; and next, to judge nicely his background, so that the children are given the place of importance. With a little thought, and the realization that the focal length of the average fixed-focus lens is barely five inches, less than one-third the eye focus, the background puzzle is readily solved. Indeed, the falsifying perspective of the lens may be counted upon to add depth and distance, and to subordinate details in the background. But *don't* overlook the undesirable details in the foreground, as did a couple who took a carriage outing of several weeks in the Vermont hills, making many exposures with a fixed-focus camera, upon, as they fondly hoped, objects of the greatest interest. Four or five rolls of film were exposed, and upon development there appeared a varied assortment of views of the rear end of the horse, which had been totally overlooked as the principal object in the immediate foreground.

Lenses.

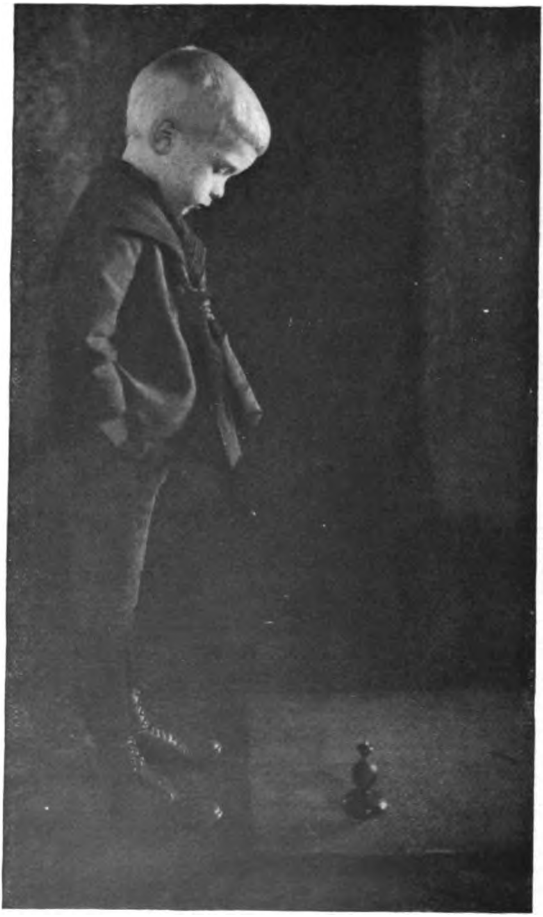
For ordinary figure work, indoors or out, or for group pictures, the average amateur equipment will meet all requirements. In working out-of-doors, on lawn, piazza or garden, a single lens is perhaps more desirable than the rectilinear combination with its habit of boring into details, and for large heads or similar work the single lens has distinct advantages. For indoor work, however, the main difficulty will be lack of light and consequent need of speed or quickness in exposure. Here the anastigmat will be found helpful, and the larger its available aperture the greater chances will we possess of winning success on dull days or under unfavorable conditions of illumination. In my own work about the house I generally use a *Goerz Series* III, No. 2, and its aperture *f*/7.7 enables me to follow my models about the room without restricting them to a confined space. This is often an advantage. Where one desires to specialize in home portraiture, a good second-hand portrait lens will be found most useful, offering still further advantage in the matter of speed. Such a lens can often be "picked up" at from $25 upwards by keeping one's eye on the dealers' bargain lists.

Tripod. In choosing a tripod for our special purpose, the chief points needing attention are that it shall be rigid and solidly built, and one which will permit us to lower the camera to within a few inches of the floor when this is necessary. Sometimes, when working on polished floors, with the tripod spread out to lower the camera, much difficulty will be experienced in keeping this or that leg of the tripod from slipping; or a hasty movement under the focusing cloth will upset camera and stand, causing such confusion as to make successful afterwork impossible. Such difficulties should be provided for in the beginning by the purchase of a tripod stay, such as that made by Mellen. At other times a ball-socket clamp, such as is sold for holding the camera to the handles of a bicycle, may be used to attach the camera to a chair-back or other convenient support. When all such devices fail to bring us the necessary adjustment (as when we want to photograph a child creeping on the rug) a low chair, stool, or box of convenient size, preferably bored to receive a tripod screw, will help to attain the end desired.

Plates. As far as plates are concerned, the most rapid will be found to be the most useful. Both for interior and exterior work they should be backed, although this is not essential. Where windows, or light draperies, or patches of white sky seen through open foliage are included, however, a backed plate gives incomparably better results than one unbacked. If we have to deal with color, such



By William Gill



THE SPINNING TOP
H. A. Beasley

as a "blue-eyed fairy," or color contrasts in dress or draperies, an isochromatic plate offers definite advantages. Whatever we use, plate or film, backed, unbacked or isochromatic, speed is the one thing necessary.

Backgrounds. The natural setting of a room, or of the garden when we work out-of-doors, is, to my mind, the most desirable of backgrounds for pictures of children. But there are times when a plain ground would be preferable indoors and out. For this purpose a sheet of gray felting two yards wide and three yards long is a convenient accessory; or one of the "six in one" small grounds obtainable for a dollar or two will be found a good investment if "heads" are wanted. Failing these, there are always the India shawl, and red or brown blankets, sheets, curtains, and other loose draperies available in the home. Out-of-doors there is hardly any background so generally useful as greensward, and the advantages of a soft, yet strong, light on a lawn with northern exposure shaded from the direct rays of the sun, need hardly be mentioned. Similarly, an ivy-clad window, a shaded corner of the piazza, the varied trunk of a tree, or a large evergreen—all offer appropriate settings in which to frame the little ones.

The Question of Illumination. In any sort of photographic work indoors the questions of illumination and exposure are invariably the chief difficulties. These are so fully dealt with in THE PHOTO-MINIATURE No. 8: *Photography at Home*, that it is needless to repeat here what may be found there. Observation and the frequent use of an actinometer about the house, under varying conditions of illumination as therein suggested, will provide a practical basis for calculation of exposures, which experience will correct and supplement.

For the first experiments as good a light should be chosen as the house affords. The nursery or playroom is usually a sunny spot, and will permit of exposures sufficiently short even for the youngest or most restless children. Half a dozen plates carefully exposed at various distances from the light source in this room will give us reliable data on which to base exposures, and we are ready for work. If direct sunlight enters the room the windows should be screened with thin muslin, open in its mesh, or our pictures will be ruined by too strongly contrasting patches of light and shadow. Sometimes we will be able to block or darken the lower part of the window we work by, thus securing a lighting which gives roundness and modeling to figure or bust portraits. As a rule, however, we will require all the light available, and the window will be stripped of all draperies that may obstruct the fullest illumination.

Single Figures. In the treatment of a single childish figure we have an infinite variety of effects from which to choose. Simplicity will most often be the keynote to success, whether we photograph the child alone or with an accessory of some sort. Among a number of prints received from Japan were several studies of a child arranging flowers and sprays of budding plants in vases. The combination impressed me as a peculiarly happy one, and its mention suggests a line of work wherein many novel and interesting effects may be obtained. The prints from Japan showed sitting or reclining figures; in Mr. Gill's picture accompanying these pages we have an acceptable hint on the management of the standing figure. The draperies need careful attention in pictures of this sort. Our endeavor should be to avoid stiffness in arrangement, and to reproduce something of texture and detail instead of the harsh and confused mass of clothing often observed in children's pictures. This, of course, is largely a matter of illumination, exposure and development.

The difficulty of shyness or reserve is more often encountered with single children than in photographing groups. This we can generally overcome by taking the child into our confidence, and explaining the camera as we get it ready, avoiding absolutely any remarks calculated to alarm the little one. I have had the best results when I had the camera set up and focused on a particular spot, asking the child, perhaps, to show me its eyes wide open for a moment while I secured the proper sharpness, and then allowing it to wander away at will. By noting the surroundings properly, the operator may avoid the necessity for any further use of the ground-glass, putting in his plate, setting the shutter, and, with bulb in hand, awaiting the happy moment of the child's return. A chain, a railing, a curtain, the open window, a door ajar, the end of the piano, a rug on the floor—all these may serve as locating points for the little boy or girl to be pictured and help us to get them on the plate.

Troublesome Friends. Generally, the chief annoyance the ambitious worker will have results from the well-intended efforts of the friends and relatives of the child to help. A charming disorder of apparel is seen; but the child is promptly taken off and hastily attired in its best bib and tucker, meanwhile being often pulled into stiffness and ill-humor. Then, when shining with the face-rubbing, stiff in its unaccustomed finery, the little one comes to the camera, the friends come too, and it is, "Now, Edith, look pleasant; *do* hold your head up!"—*Don't* stick your fingers in your mouth," and so on, *ad nauseam*, until the poor child is utterly impossible. Under such conditions I have found a little guile very useful: Let the well-meaning relatives or friends stiffen up the subject to the last notch of woodenness, and then go through the motions of an exposure, all but exposing the plate. Then, explaining that you merely want to try an experiment, drive out the friends, get the child soothed into naturalness, wait until all memory of the ordeal has passed, and take your own chance with the plate! As to clothing, there can be no question that the best is that in which the child will be most comfortable. The simpler it is, the better; it is the child you are picturing, not the dress.

It is always better, provided the worker is properly acquainted with the child, to have not more than one other person about. Nothing so detracts from naturalness, or so tends toward the usual studio-ishness of the gallery portrait, as a number of assistants. Get rid of them, all but one sympathetic helper who can be depended upon to do only what you say, and your chances of success are far better. A child is easily confused, and does not yield so well to the camera's needs when several people claim attention.

Babies.

Very young babies are hard to manage, unless in the mother's arms. The spectacle of a plump child, piled into a chair in which it is unable to sit alone, may be pleasing to the parents, but there is no picture coming. The very little one is often most charming as the mother holds it, and with proper care, results that are pleasing may be had. Unconventional pictures may be made by preparing for the work in a very bright light, the camera resting on a stool or large book, focused on a selected spot, wherein the child is induced to creep. Many dwelling houses have large windows, so that when the curtains are fully put aside the light is strong enough to permit of exposures of one-half to one second; and while some plates will be wasted, some priceless negatives may be obtained. When the child is able to stand up to a chair, the sympathetic and well-prepared worker has some fine chances, and pictures which show the bare feet of the little child are often most charming. The baby may be induced to play on a dark rug, placed in the proper light, and then it is a matter of patience and good judgment.

When Laura Smiles! A child's friends or parents always want a smile on the face, forgetting that a natural and interested expression is far more attractive than a forced smile. An amusing incident in my own experience is in point. I was working to obtain a picture of a most attractive little girl of three summers, with the active assistance of her mother, two sisters, and a friend. Poor Laura! She did try to smile every time she was besought with "Now, *do* smile a little!" But I was abundantly satisfied with the sweetly serious expression of her face after I had made a dummy exposure, and my negative is a prize. The next day I had my camera set up on the lawn, when Laura, in a sunny disorder, trotted across the foreground. I asked her to wait a moment in front of a bit of greenery which well set off her airy lightness, and just as I was ready to expose, she said, naïvely, "Do you want that same old smile?" I got the smile then, sure enough!

If the smile is needed, it can usually be obtained naturally, while the worker is doing his entertaining, or holding a confidential conversation with the little one. It is again a matter of patience and good judgment, using especially much of the former.

Groups. If the reader will avoid seeking after studio or professional ideals, and direct his efforts to making pictures of his little models in their unconscious simplicity of pose and action, the playroom may be made to furnish good material for a happy year's work. Mrs. Ward's "A Family Gathering," or Mr. Pierce's "Five o'Clock Tea," in THE PHOTO MINIATURE, No. 8, offer capital suggestions for the use of such a room. Eickemeyer's "In and Out of the Nursery," just published by R. H. Russell, is an example of how a collection of pictures made in this way may be turned to profit, and give pleasure to many in after days. The generous illumination of the playroom, and the light tone of its furnishings, enables one to work around it, so that we may attempt small groups and compositions on fine days. The innumerable arrangements which will suggest themselves to those who keep their eyes open in a room occupied by children will surprise all who give attention to the possibilities. In making pictures whereof the playroom forms the background or setting, avoid the common mistake of crowding the picture space with toys. The simplest compositions are generally the most pleasing, a single toy, or a corner of the woolly lamb coming into the margin of the picture, or a glimpse of the nursery-rhymed wall paper being sufficient to identify the locality.

Toys. In photographing children with their toys two or three little points need close attention. It is better, for instance, to wait until the little ones are really interested and busied with their toys than to get them merely holding a toy and looking at the camera. Look at Mr. Core's picture of the children watching the mechanical doll. See how its interest is added to by their intentness concerning the doll, and how unconscious they are of the presence of the camera. Those who remember Byrne's famous "Apple Pie Alphabet" will recall the cleverness with which consciousness was avoided in that charming series. This is as it should be, although there are instances where a direct portrait is desirable, as in Mr. Kemp's two pictures in this number.

Sometimes a toy in the hands of a very young child is an obstacle to success, because the baby will put things to his mouth. Here, of course, the toy should be retained by the photographer or kept out of sight altogether. When and where and how to use toys in handling children are, in fact, questions which can only be carefully answered with a knowledge of the children and the circumstances. Occupation of some interesting sort, or a picture book, may often be substituted for the toy with positive advantage. Perhaps the most charming of all the children's pictures I have seen is a group of children "playing school," made by Mr. Core. Unfortunately I could not secure permission for its reproduction here, so that we must content ourselves with a description. The group comprises five or six children of one family, and takes the form of a lateral triangle running lengthwise across a 5 x 7 plate. Four of the children, arranged in the order of their ages, are grouped closely together to form an oblique irregular line, dividing the picture space from upper left- to lower right-hand corner. The way in which they nestle together to see a folio held in the hands of an elder child is very delightful. At the left-hand the dark figure of an elder brother, busied with a design upon the miniature black-board or wall-slate adds force to the motif, and at the lower apex of the triangle sits the baby of the family, slightly separated from his fellows, independently occupied with a picture book in proud imitation of his companions. Pictorially the little figure binds the composition together, and the arrangement of lines and tones gives one a continual feast of pleasure and interest. Numberless compositions along similar lines will suggest themselves, in which the small furniture so commonly used by children nowadays may be made to help in the picture-making.

"Posing." In attempting pictures of this sort, where "posing" or arrangement enters into the scheme, a previous acquaintance with our models is absolutely essential. About the posing of children there is a wide difference of opinion, some workers holding that nature is preferable unassisted by art; but with tractable children one can sometimes take up a little serious picture-making, aided by their willing interest and desire to help. Very seldom, however, can an arrangement be carried out as originally planned. The photographer may—indeed should—have a definite plan; but if he is prepared to take advantage of his opportunities, very often his best things will come from the delightful poses assumed by his little subjects in freedom and unconsciousness. Have a plan, by all means, but be ready to abandon it the moment the subject displays something better as the work proceeds. In my own practice I almost invariably start out with two or three possible pictures in mind, and almost as invariably end by getting something altogether different. In my few attempts to insist on carrying through a carefully planned picture scheme the results have usually been conscious and stagy compositions.

Disturbances. Sometimes, while we are intent on our work with a group of children, the spirit of mischief will bubble over and speedily infect the whole group, making all our picture-making vain. This difficulty may generally be overcome by securing the help of a single member of the group who, in ways best known to himself or herself, will bottle up the mischief and give us the quiet moment needed for our exposure. There is always one among a group of children whose influence is dominant, and it is a wise thing, in working with a group of children, to first of all get this influence on our side for use if occasion should require it. This hint will be found useful, also, where we have to deal with peculiar obstinacy or shyness, which now and again threatens to undo our hopes, or interfere in the work.

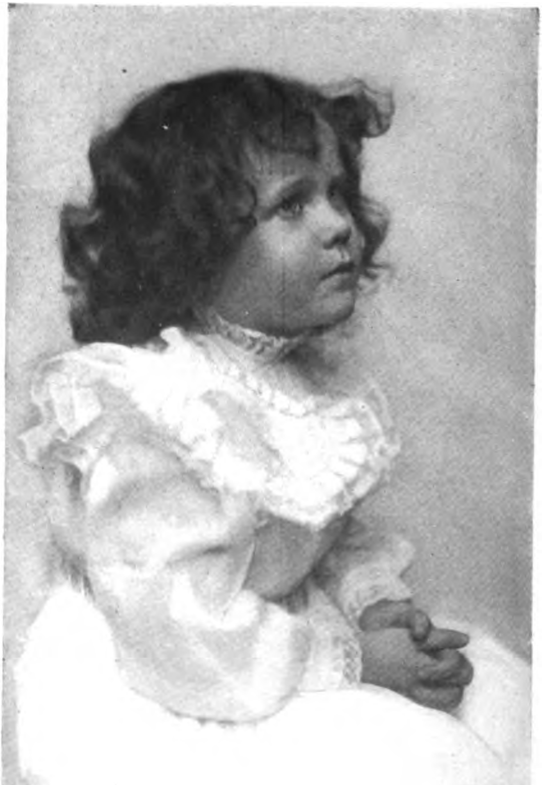
Multiple Pictures. For those who have the time and inclination for a little more than the ordinary amount of trouble, "multiple" pictures of children make an interesting specialty, and the pictures themselves give endless pleasure. A "multiple" picture is simply a combination of several pictures of a child (or of several children) on one plate, made by exposing only a small part of the plate at one time. Some very charming combinations may be had in this way, and it is surprising that such pictures are not more popular. As produced commercially these multiples are most easily produced with a special form of camera back known as the *Klay Multiplying Holder*, but this is made for use with the ordinary studio camera. By a little contrivance the amateur can rig up a device to suit his own camera, which should, preferably, be of the 5 x 7 or 5 x 8 size (cabinet).

To make these pictures, the composition must be planned beforehand, and a rough sketch made on paper to guide us in the work. As we will see later, our little models should be dressed in white or light-colorec dresses. Let us suppose we desire to make a "Banbury Cross" scene, having a little child of five years as our model. We require a background of black cloth about 6 by 10 feet, and a foreground identical in size and color. Black felt is good, cheap black velvet better. The object here is to get a ground which will make no impression whatever (of texture or form) when we expose a plate on it. Now we need a barrel big enough to let our little model creep inside, and a child's low chair or rocker. Our plan includes four positions of the child on one plate. At the extreme right end of the plate we want the little one sitting in her chair pointing at an imaginary something at the middle of the background; at the center we plan to have the child sitting astride the barrel (horse), and peeping through the open barrel with a merry face "playing horse;" at the extreme left of the plate we want her again sitting in her chair enjoying the fun. Obviously our model must be one who can enter into the spirit of the thing with some animation. Having adjusted the black background so that the lighting of the figures will be satisfactory, and tacked the foreground to the floor somewhat loosely, we proceed to pose the child in the four positions, one after another, focusing carefully at each stage, and marking the camera so that we can adjust it to suit each pose without refocusing. As a further precaution against one pose overlapping another we put black pins to mark out where each position begins and ends, marking it out also on the floor with dark chalk. Focusing being accomplished, give the model a rest, then insert the loaded plate-holder, draw the slide, and prepare for the first exposure by posing the child in the extreme left position. This being satisfactorily arranged, let the exposure be made, and this should be as brief as is consistent—a slow instantaneous exposure with a lens at *f*/8 should be sufficient. Cap the lens, remove the chair to the extreme right position, pose the subject carefully and wait for the desired expression, expose, and again cap the lens. Let the child rest a few minutes, and then proceed to place the empty (bottomless) barrel at the center of the background space, with the open end facing the lens. Now let the model creep through from the back so that she emerges facing the lens. Head, shoulders and the little arms should comprise the view, framed by the round barrel. Expose and cap the lens. Now let the child sit astride the barrel, holding a ribbon for the reins and taking an animated pose to "play the rider." Expose, and the plate is ready for development, which should be carried far enough to ensure a negative of good printing quality, but stopped before the plate begins to veil over. If due care has been taken in the arrangement of the four pictures, the result will be a "multiple," which will encourage you to carry your experiments further.

A few different arrangements may be mentioned, all of which are easily compassed. Take a barrel of dark color (not black) and nail it fast to the floor parallel with the dark background. Make four exposures showing a child peeping from both ends of the barrel, looking over from behind one end, and sitting on the top at the other end looking into the face which peeps out from that end of the barrel. A child just old enough to let us focus it may be taken, after this fashion, in four different positions on the floor, with or without toys, the positions being marked out as before with chalk and black pins. Series pictures of children at their "make-believe" occupations—washing day, putting the dollies to bed, and similar themes—may also be attempted with pleasure and profit. The details here given cover the method used very successfully by Mrs. Marie H. Kendall, to whom I am indebted for the information here given.

Flashlights at Home. For the making of flashlight pictures of children at home little needs to be added to the instructions for flashlight portraiture fully given in THE PHOTO-MINIATURE No. 8: *Photography at Home*. Since we are dealing with children, our methods and practice should be as simple as is possible to avoid alarming the little ones; and we must be careful that they do not have access to the powder, and are taught to avoid looking directly at the flash. This can be managed by arranging them to look in another direction, or to busy them in some occupation so that they do not face the camera. Small charges of flash powder, such as the single charges of *S. & M.* sold ready for ignition on a fire-shovel or tray, used singly or two together, will be ample for most of our pictures. In using flash powders in bulk, 10 grains will be found sufficient for a single figure at 6 feet, supposing the lens to be working at *f*/8.

By J. Horace McFarland



By the Misses Selby

This amount increases rapidly as the light is ignited further from the subject; thus at 8 feet we will usually need 40 grains; at 10 feet, 60 grains, and at 12 feet, 80 grains of powder. The hints and precautions given in THE PHOTO-MINIATURE No. 8 should be kept in mind.

Whenever possible, focusing should be managed without the aid of the child we are photographing, i.e., we should focus on another person, or a printed card, and afterwards place our subject in the position covered by the lens. In this way we have merely to get the pose, draw the slide, uncap the lens, and ignite the powder as soon as we get what we want in vivacity or expression. All the lights usually burning in the room should be left burning during the photographing, except such as may happen to come within the field of the lens.

Provided that we can get our little models familiar with the strangeness of flashlight photography, the winter evenings will furnish us with many opportunities for picture-making, and desirable effects unobtainable in any other way. Thus the Christmas tree, the coming of Santa Claus, the Christmas "parties," and other themes associated with this great festival of childhood, the pillow-fight, the children asleep in their usual picturesque disorder, etc., are all subjects made possible by flashlight work. The making of flashlight silhouettes also suggests itself in working with children, their dainty figures and comical attitudes lending themselves happily in work of this sort, as suggested in *Photography at Home*.

Children Out-of-doors. Turning now to children out-of-doors, much of what has already been said still applies, but the possibilities are vastly increased, because the great difficulty of illumination (or the lack of it) has vanished. The larger freedom of child-life out-of-doors is also in our favor as picture-makers, and our success will most largely depend on our ability to grasp the opportunities as quickly as they come and disappear. Two methods may be followed, and it would be difficult to say which of them will yield the most satisfactory results. We can set about the work seriously, bent on compositions of which children shall be the *motif*—of which the frontispiece of this number is a clever example; or we may take the camera and one or many children and, sallying forth to the nearest play-ground, catch what turns up by liberal use of our store of wit, patience and films. For my own part, I confess my preference for the latter method. There are few things in life more thoroughly enjoyable than an afternoon, or an hour or two in the morning, with children and camera in the open. It may be that our play-ground is a city yard with a pitiful shrub or two, or the lawn about a country house, a city park, country lanes and fields, or we may follow the city streets in search of material. It matters little. Wherever we find children out-of-doors we will find picture material and fun a-plenty, and our only difficulty will be that the film is all too short, or the filled plate-holders too few.

Some Subjects. The children's supper party on the lawn, under the shade of a friendly tree, as Mr. McFarland pictures it among our illustrations, is an easy subject, because the youngsters will very cheerfully stay just where we want them. Three rollicking boys in front of a group of birches, with full knowledge that they were being photographed, are by no means so easily handled. Perhaps we can take advantage of their mock seriousness to focus and put in the plate. Then we tell them that there need be no hurry about it, and straightway, like all other boys, they will unlimber their seriousness and take life easily —which brings our chance for an exposure of $\frac{1}{10}$ second, and they are ours. Roam around a city park, and its boat landing on the lake, or the smaller lake set apart for boys and their model ships, the goat carriages and donkey rides along the shady avenues, the merry-go-rounds, and the children watching the animals at the Zoo; all will yield prime material for the camera and bring into play our every resource. A hand-camera, of course, is needed for such work, as well as deft handling on our part; and it will be well if we do not expect a perfect picture for each exposure.

Exposures. The best time for children out-of-doors is before 10 a. m. and after 3 p. m. Between these hours the sun is too high, and we will miss the most pleasing effects in lighting. Care is needed when photographing under trees in sunlight or our pictures will be spotty, with patches of light and shadow marring the general effect. Exposures in the open are best made when the sun is just obscured by a cloud, unless we are deliberately seeking sunlight effects. With a good diffused light exposures from from $\frac{1}{5}$ to $\frac{1}{20}$ second will be ample, although we must be guided by the usual factors and the distance of camera from subject. For snap work in a bright light *f*/8 and "medium fast speed," may be relied upon to give fully timed negatives. Where motion is included, the speed, as a matter of course, must be increased.

Background. In photographing children against a clump of trees or other outdoor background, the subject should be at least ten or twelve feet from the background; and when working with one child only, it is better to focus on a card pinned to a stick rather than on the subject. When the focus is secured, place the child in position and make the exposure before consciousness appears. When working at the seashore, or in low-lying places, avoid, wherever possible, photographing your subject against the sky, or sea, or lake, as this will make the features extremely dark, the distance here being a source of light.

The intensity of the light out-of-doors makes necessary a word of caution where outdoor portraiture is attempted. In a strong light the iris of the eye contracts, and this is accompanied by a half-closing of the eyelids—which is undesirable. The remedy is obvious. Make your outdoor portraits in the shade of a tree or enclosed space prepared for the occasion, and watch for the effect of the light upon the eyes of your subject.

Outdoor compositions with children, such as Mr. Tingley's "Innocents Abroad," fall under the heading of landscape with figures—a field too big for us to enter here.

We have yet to consider children from the view-point of the professional photographer. This division of our subject is one about which much can be said with profit, and I have purposely left it unto this last to give the professional reader an opportunity to first glance at the matter through an amateur's spectacles.

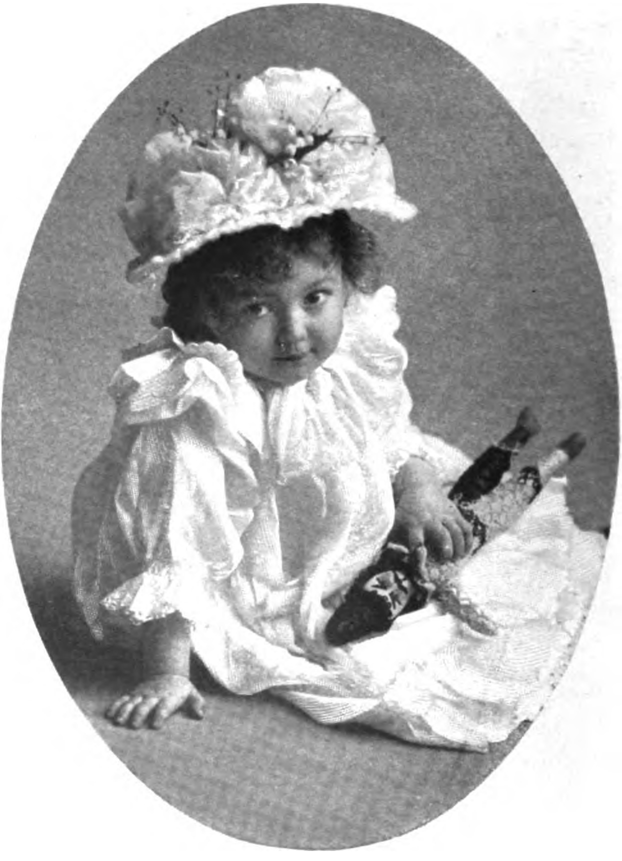
Despite the awakening referred to on an earlier page, there is need of a further change of heart concerning children among professional workers. The boastful phrase, so common among professional announcements: "We make a specialty of children" indicates where this change of heart must begin, i. e., in a better understanding of children, and of the methods to be used in order to handle them successfully. Mr. Rockwood, in his little book on "Child Beauty," puts the thing into a nutshell where he says: "No man can make a specialty of children. They must make a specialty of *him*."

That a profitable business can be quickly built up, if the children form the corner-stone, has been proved over and over again. They form, in fact, the most powerful aid within the reach of photographers, since it may be safely said that the studio which draws the children of its locality will speedily secure the good will and custom of the grown-ups also. But the conditions upon which success depends are at least as inexorable and imperative with professionals as with amateurs.

Mistakes. Perhaps the most obvious mistake made by professionals in their portraiture of children lies in the lack of reverence and simplicity which marks their treatment of children as subjects. The influence of environment, the effect of the strangeness of the studio and its methods upon the child, are points which rarely receive much consideration, although they exercise a real and direct influence upon the result of the sitting. The beautiful reserve of childhood, the natural sensitiveness and dignity which restrain most children from any familiarity with strangers until there has come a mutual understanding, are things which the average professional recognizes only to brush aside as undesirable. His method, as my observation has told me, is to carry the child through the sitting on a wave of excitement. There is a feverish and noisy activity in all his dealings with the little ones, from the flurry of "fixing up" both children and the studio for the event to the end of the performance under the skylight. The shake-up in the studio, the hurried rearrangement of accessories, the exaggerated funniness of the operator, the anxiety of the mother or nurse accompanying the child, and the general hubbub, all combine to develop in the little sitter the very qualities which make a successful portrait the most remote of possibilities. What is the remedy? Granted for the moment that the photographer has a strong liking for children, and is willing to take the pains so essential to the best results, how shall he overcome the real difficulties created by the strangeness of the place and its people, and make pictures portraying his little visitors as they are in the familiar environment of home life?

Remedies. A great deal may be accomplished by taking away from the studio-methods all that emphasizes its unlikeness to home and its surroundings. Let special appointments be made for children's portraits wherever possible, and set apart a children's reception or waiting-room for their sole use. Furnish this room in a simple but attractive way with pictures of children, furniture suitable for juvenile uses, a few toys, animals, and a simple game or two to beguile the time of waiting. A large music box, set into the wall as a fixture, will often prove itself a potent charm with timid or obstinate children. That the room should be clean, bright, and sunny, cool in summer and warm

By John H. Kemp



By John H. Kemp

By J. M. Dent

By Henry H. Pierce

in winter, goes without saying. The aim in all this, of course, is to put the child at its ease, and to overcome any feeling of constraint or shyness. The photographer should meet his little visitors in this room and, in a few minutes or after a half hour's wooing, perhaps, become acquainted with the general characteristics of his subject before the sitting begins. Those who accompany the children should be warned, if needs be, not to discuss the sitting, or to instruct their charges concerning their behavior, or bother them with too much preparation. Everything else being favorable, the children's brief stay in such a room cannot but have a good effect on the after-work. It should, indeed, convey the impression that the photographer's studio is almost as nice a place as the familiar play-room at home.

In the Studio. Meanwhile all the preparations necessary in the studio should have been completed, so that when the child comes under the skylight, the place is quiet and ready for the sitting. One assistant to change the plates, or focus, may generally be retained at the camera with advantage, although this is not followed by such skilled workers as Mr. Core or Mr. Hollinger. The assistant should be well trained to play his part without attracting attention. Wherever possible *all* friends and relatives should be kept out of the studio during the sitting, but most often it will be needful (essential with young children) to permit a single helper to accompany the child.

In the general handling of children the photographer must be guided by his quick perception of the character of the child with whom he has to deal. Some children are easily excitable, and care must be taken not to rouse them overmuch; others are retiring and lacking in animation for one cause or another. These latter may be skilfully interested by the use of a little diplomacy. The photographer is usually a good judge of character, acquiring the habit unconsciously in his daily work, but he will need all his knowledge of human nature for successful work with children. Thus he should know how to tell the sick child from one that is well, the peevish, fretful, nervous child from one laboring under temporary timidity. Some children require a little "fuss" before they will be "drawn out;" with others quietness is the easiest way to win; and some are best left severely alone. A display of noise and bustle is the common blunder, and the lavish use of novelties of one sort or another may also be mentioned as requiring restraint. One thing is certain, if friends or relatives are permitted to be present at the sitting they should not be allowed to interfere with or instruct the child. In dealing with very timid or young children the mother or friend may advantageously help in any physical handling of the child—this detail being one to which many children are strangely sensitive; but her help should be given with eye and hand, rather than by word of mouth. In other words, the sitting should be as far as possible a matter between the photographer and his subject, free from outside interruption or interference.

Babies. With very young children difficulty will be experienced in getting their attention directed to any one spot for the moment needed for exposure. The best course to follow in such cases is to get the focus, put in the plate ready for exposure and then, in absolute quietness, gently tap the floor. This will generally attract the attention of the child, without alarming it or causing movement, and the opportunity for exposure is gained. With older children whose attention wanders from one thing to another without resting on any one thing long enough for our purpose, the undemonstrative recital of a childish tale will often secure the degree of repose necessary. The vivacious child, of course, can be managed by being "let into the game" and impressed with the feeling that the success of the affair rests upon him. Or we may busy our subjects with some simple occupation, picture-book or toy, and at the desired moment get their attention for the exposure. Mr. Nast, after long experience with children under the skylight, advises the use of the singing voice as an excellent way of gaining the interest of dull or indifferent children. By this he means the photographer to sing the necessary directions instead of speaking them. This may arouse apprehensions as to the photographer's sanity in the minds of older people present; but we are told that the children enjoy the method, and the sparkle and brightness of animation are what we seek. Sometimes young children will persist in making "funny mouths," especially when the little teeth are coming. This can be overcome in part by touching the tongue with a small pinch of salt, which causes the child to close its mouth for a moment, during which the exposure should be made.

There is a common desire among mothers for a picture of baby smiling. Don't indulge it without an attempt at a second picture without the smile. A smile is pleasing at a first glance, but one wearies of it in a picture where it cannot change. Babies have as many moods as older folk, and are interesting in every mood, but the smiling baby does not wear well. Get the child interested, listening, looking for something or busy with its toes, and you will be just as gratefully remembered as if you had caught the smile.

As far as posing is concerned the less said the better. Children from one to eight years are graceful in every move, that is, in free and spontaneous movement. From eight to fourteen years there is a little awkwardness, and simple poses will be most successful. With girls the three-quarter or full length figure may be attempted; with boys the full figure should generally be avoided. But there are exceptions always. For my part I prefer Mr. Hollinger's method of letting the children loose in the studio, keeping them interested, and using a plate at every opportunity. This "wastes" plates, but ensures variety of pose and expression, absolute spontaneity, and now and again a picture which could not be obtained by a hundred deliberate poses. In his studio Mr. Hollinger has a movable platform—which moves easily and noiselessly—and many of his most delightful pictures of children have been secured by its aid, between "rides" and "talks." This method, of course, is in keeping with "home" methods.

Mr. Beasley, whose "Spinning Top" is given among the illustrations, is a believer in profile picture of children. Mr. Core likes to picture his little visitors busied with some childish game or occupation, although his portraits of children are as varied as the children themselves.

Groups. Where two or three children of the same family are to be photographed together, many pleasing combinations may be had by interlocking the figures in such a way as to secure unity, and yet keeping a desirable degree of separation in the figures. I have seen a clever example of this, offering a suggestion not yet made common. A group of four children—three girls and a boy—was arranged so as to display an oblique line of heads in profile, with the figures intertwined here and there by linking the arms of two of the children. The balance of the upper portion of the composition was secured by lettering the children's names in the upper left hand of the background, while the lower portion of the picture was held together by the lines and masses of the draperies.

In dealing with babies (clothed) care is needed to see that the child is not lost in a mass of white linen. It is usually a difficult thing to get a picture of a young baby showing the whole of the face and hands or feet because of the superabundance of clothing *and* ribbons. But it can be done by patiently watching for the right moment. With babies minus any clothing we must strive for a pleasing outline, avoiding unsightly creases over the abdomen, etc. The full figure of a child, without clothing, is a favorite style with some mothers, but is seldom beautiful. The half-figure, as Mr. Partridge pictures it among our illustrations, is generally preferable.

Our survey of children in the studio may fittingly close with a word or two about backgrounds and accessories. Much of the staid and solemn look of the little ones, as portrayed by professional workers, is due to the use of grounds and accessories properly suited to older folk, but too heavy in line and tone as a setting for children. Simplicity should be the keynote here as elsewhere. A plain ground of light warm gray tone, or a dark ground of warm black tone will form a more tasteful and more effective setting for the average child than the usual fancy ground used in the daily work of many studios. The delicacy of Mr. Core's work offers proof of the advantage of this simplicity. Palms, rattan ware, fur rugs, and curly-legged abominations can only serve to distract attention and confuse the picture lover who would fain enjoy the beauty of the child. Now and again the child may be enshrined with pictorial effect in a richly carved chair, as in the frontispiece of THE PHOTO MINIATURE, No. 8, but this will be the exception. For the majority plain grounds and the daintily designed furniture made for the little people will serve our purpose in a better and more acceptable way. But this is a matter of taste and feeling, and the educated eye knows well the pleasures of simplicity. Mr. Core uses white holland for much of his work, and "continuous grounds" of painted sail-cloth.

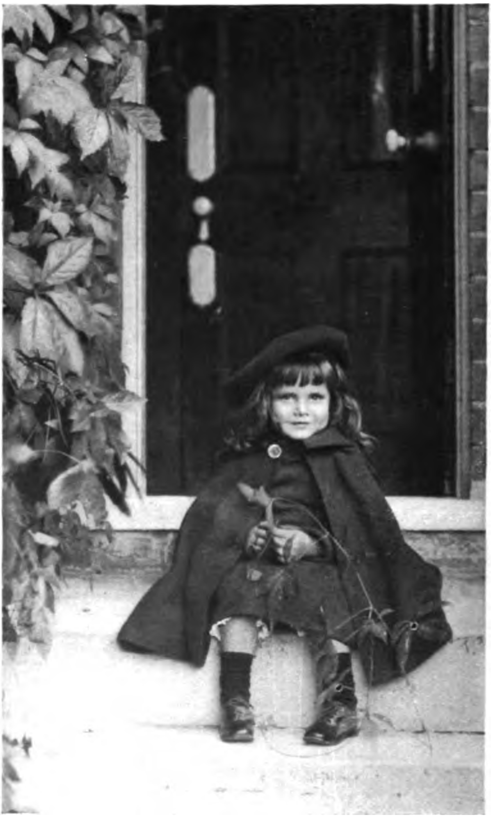
Acknowledgment is due to Mr. J. Horace McFarland, Mr. Chas. Nast, Mr. Core, and those who have helped me materially by their advice and pictorial lessons. These latter give the little book a value which it would otherwise not possess.

BOOKS.

There are no books dealing in a special way with the photographing of children. I would suggest that the interested reader may most happily make his own book by forming, from the many inexpensive reproductions now available, a collection of pictures of child-life as portrayed by lovers of children from the days of Botticelli (1447) down to our own times.

3041

By J. Horace McFarland



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NOTES.

The San Francisco Photographic Salon, of which we made brief announcement last month, will be held in the Mark Hopkins institute for two weeks commencing Thursday, January 17, 1901.

The qualifications of accepted pictures must be artistic merit combined with pictorial interest; and as the exhibits will be divided into seven classes it is to be inferred that sound photography will not be sacrificed to soulful indefiniteness. The seven classes are: Landscape, Marine, Genre, Portraiture, Still Life, Animal Studies, and Architecture including interiors. The Mark Hopkins Institute of Art will award first and second certificates of merit in each class, and *Camera Craft* will supplement these awards by an equal number of first and second medals. The awards will be on the recommendation of the Board of Directors of the San Francisco Art Association. Those who wish may have their pictures excluded from participation in this competition.

The following are the official rules and regulations:

All pictures submitted for exhibition must be framed or matted under glass. They must also be addressed: "Photographic Salon, Mark Hopkins Institute of Art, San Francisco, California," forwarded at owner's risk, charges prepaid, and delivered at the Institute not later than January 1, 1901. Pictures to be returned at owner's expense. No charge will be made to exhibitors for space.

The title, the exhibitor's name and address and, if for sale, the price must be on the back of all pictures submitted. Nothing shall apear on the front of the picture except its title and the maker's name. Pictures exhibited must bear the name of the maker and not the names of firms or galleries.

If any pictures are sold while on exhibition ten per cent of the price will be deducted by the Institute.

Every work for exhibition must be submitted to a duly elected jury for a decision as to its acceptance or rejection; the hanging and placing of all accepted works will be under the exclusive control of this jury, and no changes will be made in the arrangement, nor can any work be withdrawn before the final closing of the exhibition.

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The management will use all possible care to prevent, but will not be responsible for, any loss or damage that may occur.

Entry-forms and particulars may be obtained from the Executive Committee of the Photographic Salon, 819 Market St., San Francisco, Cal.

◆

The American Annual of Photography and Photographic Times Almanac. 1901. Scovill and Adams Co., New York. Paper, 75 cts.; cloth, $1.25. Mailing, 15 cts.

The fifteenth "American Annual" differs in several points from the issues of previous years, and is a solid advance from many of them. There are signs throughout the book of careful work, and the result is one which must be satisfactory alike to the publishers and to Mr. J. C. Abel, the editor. The annual is improved by the deletion of many pages of useless formulæ or other dead matter, which has appeared in previous volumes, and by the bestowal of additional care on those appendix pages which are retained.

The contributed articles number less than thirty, a notable decrease in number, which is balanced by greater length. There is an evident attempt to replace the many fragmentary contributions of former years by matter of more value, and while the articles are, as usual, unequal in this respect, several of them are distinctly useful.

In the pictures, always a leading feature, the same care is apparent, and the result good. There is not more than a reasonable percentage of poor pictures, and among the pictures by known workers there are a large proportion which are typical of and worthy of their producers.

◆

The Paris Exposition has followed a not unusual, but very ridiculous custom, in some departments of its awarding. In the section of pictorial photography, for instance, a medal was bestowed on the collective exhibit, thereby entitling each exhibitor to a medal. In the section of books and magazines a collective award gives the privilege of announcing a similar honor to more than a thousand American publications. Of course the medal is not given, only the honor, unless the decorated one provide the former at his own expense.

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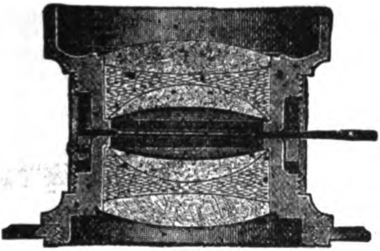

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A letter from Denver brings the good news that Dr. J. C. Millen has recovered from his recent illness, and is perfecting arrangements for the better distribution of his *Etching Matte, French Satin Jr.* etc. in the East. Dr. Millen's specialties have won an enviable name by their splendid quality, but they have not always been readily obtainable from Eastern dealers. We are glad that this is to be remedied. The dainty price list of the J. C. Millen Mfg. Co., Denver, will inform the reader concerning the Millen specialties, and the things it announces are all they are claimed to be—which is not always so in other cases.

◆

We learn on reliable authority that the new *Lovell* plate—the one which is "as rapid as any plate on the market"—is making many friends among professional photographers who seek speed and quality combined for studio use. What is good for the professional is in this case equally desirable for the amateur. *Moral:* try the new *Lovell Extra Rapid* in photographing children (old and young) indoors and out. Western readers, by the way, should look in at the Chicago office of the Lovell D. P. Mfg. Co. and have a chat with Mr. John Pringle, the manager of the Western branch, mentioning this Magazine. They will receive a hearty welcome, and learn some things about plates worth the knowing.

◆

The air is full of year books, orders for year books, and complaints about year books! Wilson's "Mosaics" is this year to be vastly improved, and will be an attractive volume pictorially. Its practical value is so well known as to need no mention. Ready December 1st. 50 cents. The "Times Annual" is noticed elsewhere in this issue. It is now ready for delivery and, as a picture book alone, is worth twice its price. 75 cents; postage 15 cents extra. Anthony's "Annual" is promised for November, and has some special features not yet fully announced. 75 cents, postage 15 cents extra. "Photograms of the Year 1900," with all the best pictures, American and foreign, and some interesting critiques on the year's output, is promised for December. Paper covers $1.00, post free; but this is one of the books more desirable in permanent cloth covers at $1.25, post free. "Penrose's Pictorial Annual"—the only year book for process workers, is also announced for December. Price $1.50 post free, of Tennant and Ward, New York.

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A recent number of the *Photo-Era* (Boston) contains an interesting paper on amateur lens making by "An Old Lens-Maker." We extract the following, pointing out the important fact that the value of a lens depends upon its optical truth:

Combining the crown and flint lenses of an objective or, in fact, any achromatic lens (unless the operator thoroughly knows what he is working for) is a very difficult and dangerous task—difficult on account of the task of optically centering the crown and flint, and dangerous because of expansion and contraction of the different metal of which the crown and flint are composed, whilst in the oven for baking. When you make a lens hot for uncementing, the chances are that it will not part, as there is no cement there to *melt*. That is because the balsam is so completely backed that it has set absolutely. This is especially true in old lenses. Old-time lenses never come apart in baking, but are put, suspended in a bag, in a specially made kettle, and boiled, sometimes for two hours. The necessity for baking was evidently overlooked in the article mentioned. This is really a most important operation. The flint glass is usual concave meniscus, so that the center of this portion is extremely thin, and heating such will be attended with danger of cracking. The mistake of warming the lens and putting on cold balsam would cause steam or moisture, which is imprisoned between surfaces, and visible in finished lenses. A lens allowed to cool, as the article says, would take a week to set firmly, during which time it would undergo many changes in temperature, and as many chances of decentering. Lenses are usually baked for about five hours in an oven, in cells purposely make to ensure the glasses being optically centered. When nearly hard, they are then pressed centrally, and in some cases the operation has to be repeated. Some firms have horizontal, and some vertical, spindles, running absolutely true, in which the lenses are placed for cementing, and centered by means of a light. One light is the image, and the other its reflection—or, as the workers call it, "the ghost." There are four lights visible in an ordinary achromatic combination—two images (one from crown and one from flint), and their "ghosts." The way the lights chase each other round is most bewildering to the novice. When the two lenses are optically central, these lights, although the lenses are revolving, appear at perfect rest, and this is an absolute proof of the optical centering of a lens. A good lens not optically centered is worthless,

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5	9	6½ x 4¾	7½ x 5	8½ x 6½	45
6	11	7½ x 5	8½ x 6½	9 x 7	60
7	13	8½ x 6½	9 x 7	10 x 8	77
8	15	10 x 8	12 x 10	13 x 11	102
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10	21	13 x 11	15 x 12	18 x 16	180
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causing aberration, principally chromatic. If people only knew the fine work, care, and brains put into our high-class lenses, they would cease to wonder at the prices.

◆

A printing-out silver paper, coated on raw Rives paper, is among the most recent British novelties. It is said to yield rich tones with less gold than the ordinary printing-out papers, and has a softer surface finish than the extremely glossy papers. On this side we hear rumors of a new printing paper giving silver prints altogether indistinguishable from carbons in appearance. This is to be introduced by the American Aristotype Co., but is not yet ready. Then there is the *Pattersontype* paper, which hails from Norristown, Pa, and gives soft black and white prints on a finely grained matt surface Rives paper.

◆

The Society of German Amateur Photographers, of New York, announces its annual exhibition, to be held at 12 St. Mark's Place, November 3 and 4. New Yorkers and others interested in amateur photography are "cordially invited to attend" the society's show.

◆

The *British Journal Almanac* for 1901, bigger than ever, and as full of good things photographic, is promised for December. It is to be edited by Mr. Thomas Bedding as in past years.

◆

One of the simplest and most practical accounts of "fixing" negatives and prints — itself a simple but often little understood operation — is to be found in the *American Amateur Photographer* for October. Another interesting item in the same number is an illustration of a photographic *menu* card; and still another good thing is the lucid paper on "Ammonium Persulphate as a Reducer" by D. Nyblin. Dr. Nicol usually gives us a magazine worth having, but in this issue he has surpassed himself.

◆

According to Professor Namais, ammonium persulphate may not only be used as a reducer for negatives, but also as a means of destroying the action of light upon an undeveloped plate. This, of course, is something rarely, if

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ever, to be desired, but as the action of the persulphate is gradual, this hint may be turned to useful account where extreme over-exposure is known before development. A two per cent solution of the persulphate is said to destroy the undeveloped image by immersion for five minutes. Thus a few seconds' immersion of the plate in a weaker solution (determined by experiment) should materially reduce the effect of over-exposure, after which the plate should be washed and developed as usual.

Namais also tells us that if an over-exposed carbon print is immersed for half an hour in a five per cent solution of persulphate, to which one per cent of sulphuric acid has been added, development will proceed normally with warm water. This is said to result from the formation of chromic acid by the action of ammonium persulphate upon chromic oxide in the film of the print.

❧

A serviceable color-screen, for use with lenses of not more than eight inches focal length, may be made as follows: Take a lantern plate, selected for flatness of surface and even thickness; fix it in hypo solution and wash well. Now immerse it for five minutes in a cold saturated solution of auramin O. The intensity of the screen may be regulated by giving it more or less washing after bathing. This dye, auramin O, is said to absorb the blue and violet rays. Not having had time to obtain the dye in question we give the information for what it may be worth.

❧

The subjoined letter is interesting as one which probably a thousand amateurs would write if life were not so short:

"HARTFORD, CONN., *September 16*.

"I have read many numbers of THE PHOTO-MINIATURE hoping to find some allusion to the possibility of having (in the near future) a camera of *aluminum* instead of the pretty but heavy mahogany, and the new *Secco* films which I understand have all the advantages of glass plates without their weight and bulkiness.

"I have been unable to find any reference to either of these possibilities. The *Secco* films are, I understand, owned by an English firm, and are not yet introduced into this country.

"Such a combination as I have suggested would be a a most desirable one, and especially pleasing to the ama-

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teur who wishes to take views — say 5 x 7 — when on his travels.

"The lightest hand-camera that I know of — 5 x 7 size — weighs 8 pounds when loaded with 6 plates. Add to this the weight of the tripod and you have an exceedingly cumbersome outfit for a long walk or a scramble over hilly country.

"Won't you tell us something about the *Secco* film and advocate the use of aluminum for camera frames in an early number of THE PHOTO-MINIATURE?

"Yours, ——— ———."

There is no doubt but that the average 5 x 7 camera, with its accompaniment of glass plates and tripod, is a drag upon one's enthusiasm after the first hour's walk out-of-doors. But our correspondent's case is not quite as bad as he makes out. The No. 5 *Cartridge Kodak* 5 x 7, with a spool of film giving a dozen exposures, does not exceed 4¼ pounds, and aluminum is as largely used in its construction as is desirable when we remember that aluminum is not all it might be, as far as rigidity and wear are concerned.

It is not generally known, perhaps, that camera manufacturers here and abroad have experimented with aluminum extensively for camera fittings and lens tubes, but without success. Hence their conservatism. But, with the rest of the world, we look forward hopefully to the day when our apparatus will not be so wearisome. Strange to say, there is also a strong current of opinion running the other way, and many amateurs are buying plate cameras in which solidity and strength of construction are important features.

Secco films were fully described in THE PHOTO-MINIATURE No. 7, issued just a year ago. Since that time little progress worth mentioning has been made beyond the building of an English factory, and a great deal of talk. A very complete description of the new factory appeared in *Photography* (October 4), and the films themselves are advertised in the same journal as at last obtainable. "All About Secco" is a little booklet which "may be obtained by all who mention this paper" and address Secco Films, Ltd., 39 Lombard St., London, E. C.— which exhausts our present information.

◆

The Photographic Society of India announces its eleventh exhibition, to be held at Calcutta, in January, 1901. Five gold medals, ten silver, and fifteen bronze medals are offered, but the secretary writes: "We will

TWO POINTS

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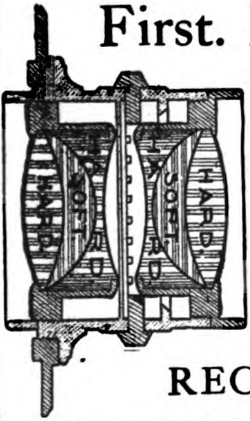

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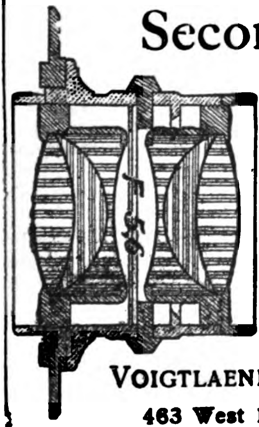

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be very glad to receive pictures from exhibitors willing to assist us by exhibiting their work without competing." Arrangements are being made whereby foreign exhibitors can send their pictures to an address in London, whence they will be forwarded to India at the society's expense. Communications should be addressed to T. C. Downing, 57 Park St., Calcutta.

◆

There has been a Voigtlander Euryscope "boom" among many of our well-known portraitists of late. Van Norman, Pierce, Kasëbier, Hearn, Spellman, Histed, Partridge, and Knaffl Bros., are among the happy owners of "the famous Euryscope." A catalogue, with particulars, may be had from B. French & Co., 319 Washington St., Boston, the exclusive American agents for the Euryscope.

◆

Mr. F. W. Guerin, of St. Louis, and Mr. Felix Raymer, the shining light of the Illinois College of Photography, have opened a new college of photography at St. Louis. The catalogue obtainable for the asking, tells "all the glories of the coming days" in picture and prose. Readers ambitious for the honor of becoming full-fledged professionals should see this catalogue.

◆

The disastrous fire at the salesrooms of Messrs. E. and H. T. Anthony & Co., 124 Fifth Avenue, New York, put an end, temporarily, to the interesting demonstrations given there for the Amateurs' Institute of Photography. All traces of the fire have now been removed, and the work of the Institute is once more in full swing. The demonstrations announced for October cover many interesting branches of photography, and amateurs residing in or near New York should take advantage of these opportunities which are now shared by 2,000 members.

◆

"How to Sit for a Photograph," written and very fully illustrated by the veteran George G. Rockwood, is an unusually interesting paper in a recent issue of the *Metropolitan Magazine.*

◆

A fifth edition of the G. Cramer Dry Plate Company's catalogue has just been issued. In outward form it is a facsimile reproduction of a box of Cramer plates, and the

All dry plates work best when fresh

CRAMER PLATES

will hereafter be protected with a label on the bottom of each box of plates, limiting the time within which the plates should be used for best results. We consider this protection necessary to guard our patrons against plates which have deteriorated by age.

We feel that this long-delayed action is in the right direction, and will be appreciated by our friends and the trade generally.

G. CRAMER DRY PLATE
CO., ST. LOUIS, MO.

NEW YORK DEPOT
32 East 10th Street

quality of its information is identical with the qualities of Cramer plates. Practical directions for negative making, developing, and the like are given, and the booklet is, altogether, a desirable item for the nail above the dark-room sink.

❧

By a clerical error the names of Charles W. Hearn, of Boston, and J. C. Strauss, of St. Louis, were omitted from the published list of Salon exhibitors at the New England convention. Some remarkably clever work was hung in this Salon and it is right, therefore, that all whose work was chosen for it should receive the honor attached to the choice.

❧

The Bausch & Lomb Optical Co., Rochester, was awarded a gold medal at the Paris exposition, for the excellence of its lenses, shutters, and photographic accessories. This award came as a surprise the medal being given to their specialties as exhibited on the apparatus shown by other manufacturers.

❧

The Krōmskōp Company, of Philadelphia, has opened a studio for color reproduction at 18 West 33rd Street, New York, under the management of C. Burr McIntosh. Visitors to New York should grasp this opportunity to examine the *Kromskop* in all its several varieties — a wonderful instrument even in these days of superlatively wonderful achievements.

❧

Willis & Clements, of platinotype fame, announce an embossed *Rembrandt* mount having a depressed mat and raised center of peculiar effectiveness for the display of platinotype prints. These mounts are obtainable in eight sizes and three tints — sepia, black, and green, or special sizes and tints may be obtained by order.

❧

We have received a few copies of the book-list of Gauthier-Villars et Cie, the well-known publishers of French photographic books, and will be pleased to send a copy to any one desirous of possessing it.

Perfecter

PLATINUM

WE invite your attention to this grade of pure Platinum Paper, believing that the most discriminating worker will be highly delighted with results obtained with it. Exquisite gradation and delicate shades of black and gray are most artistically obtained. This brand of Platinum Paper is particularly recommended for artistic and beautiful results in portraiture.

Artisti

PLATINUM

IN response to the demand for a good grade of pure Platinum Paper, at a medium price, we have placed ARTISTI PLATINUM on the market. It is particularly recommended for landscape and view work, though excellent results are obtained in portraiture. We solicit a careful trial of this brand, believing the paper itself will proclaim its merit, far better than we can tell it.

All our papers are made by the Kirkland-Wallace Process, in Denver, Colorado, where the dry atmosphere is unequaled for the production of perfect Platinum Paper.

Sample package of either PERFECTER or ARTISTI Platinum Paper in 4 x 5 size, with developer for the same, sent to any address on receipt of twenty-five cents, by addressing

The
Camera Chemical Co.
Denver, Colorado

Scovill & Adams Co., Trade Agents
New York

Since writing the note on page 277 of our last issue, we have given careful trial to the new platinotype papers, *Perfecter* and *Artisti*, introduced by the Camera Chemical Co. of Denver. Both papers are made in two grades, viz: rough and smooth in surface-finish. *Perfecter* is a heavy-weight paper, very suitable for artistic effects in portraiture or subjects where breadth is desirable. *Artisti* is a thin light-weight paper of remarkable purity, and is intended for views or similar subjects wherein detail is required. This brand is notable also for its reasonable price (25 cents for a dozen pieces 4 x 5 inches), the lowest, we believe, at which a pure platinum paper of good quality has yet been offered. The prints we obtained on these papers exhibit all the qualities which have brought platinum printing into its present popularity, and their introduction is happily timed.

◆

Mr. Edward W. Newcomb has resumed the editorship of the *Photo American*, with offices at 131 Bible House, New York, and threatens to continue, at the same time, his contributions to "from four to fourteen" photographic journals, as well as the manufacture of his *Non-Halation Backing* and *Ideal Spotting Medium*.

Note: In buying the "Backing" or the "Photo American," be sure to ask the man for the "Improved" variety. The spotting medium is "Ideal," and can't be improved.

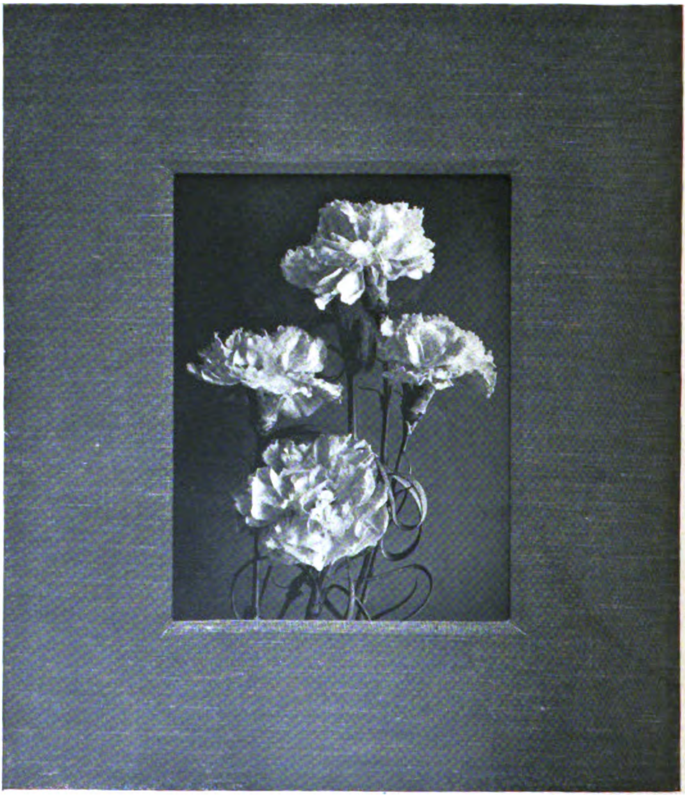
◆

Lengthy, and abundantly illustrated reviews of the R. P. S. Exhibition and the *Salon* may be found in the issue of *Photography*, for October 4 (3 St. Bride Street, London, E. C., 5 cents). A more comprehensive review is promised in *Photograms of the Year 1900*, for those who can wait a few weeks; and a brief report may be seen on another page of this number.

◆

Among the American photographs awarded a gold medal at the Paris Exposition was a collection of 75 pictures sent by Mr. J. Wesley Swan, as part of the display made by the Grand Trunk Railway. These photographs were from negatives made on the new *Standard* plate of which we have heard much favorable report during these last few months.

315



CARNATIONS
J. Horace McFarland

THE PHOTO-MINIATURE

A Magazine of Photographic Information

EDITED BY JOHN A. TENNANT

Vol. II NOVEMBER, 1900 No. 20

TRIMMING, MOUNTING AND FRAMING.

However well composed the scene which the photographer secures on his negative, however fine and expressive the print, the message of beauty or realism which is intended will measurably fail in delivery if due attention be not given to the trimming, mounting and framing. Although these may be considered as subordinate or accessory points in the scheme of art comprehended in a completed work of photography, they are of extreme importance to the full success of the attempt. A photograph is seldom, like a flower, complete and finished in itself, needing no aid to bring out its best points.

The reason for this is readily determined. All will remember attractive views seen through archways, doorways, windows, the full interest of which did not present itself when looked at in the open. The separation or apparent concentration of the view by the opening, be it window or what not, through which it appears, and the exclusion of the great sweep of the landscape, together with parts which often are unattractive or inharmonious, make the picture for us. It is framed, and we like it.

An especially vivid realization of this principle appears when one looks upon any well-composed view, projected by the lens of a camera upon its ground-glass screen. Here are all the colors of nature, intensified by the reduction in size; here are depicted the forms of beauty in the landscape, the lines and contours of trees and hills. And all is confined by the visually black framing of the glass, with the focusing cloth extending the effect; the picture is trimmed and mounted, if you please, by and in the support of the ground-glass, and framed in the surrounding darkness of the camera and focusing-cloth.

Underlying Principles. The methods of this important after-treatment of a picture are many and various, but it is not impossible to separate from the mass of practice, good, bad and indifferent, certain principles which will serve as guiding points toward the end of most agreeably bringing out the full attractiveness of the composition. Artists in oil or water-color have been known to despise the frame, and to say that the mounting and framing were unimportant, the artist's work being solely with the picture. Other artists view the matter differently, and insist that the picture is not completed until finally framed, the frame being considered as an integral part of the whole, without relation to its office of supporting and protecting the canvas. This latter view is certainly the correct one, and it is to bring about proper consideration that the subject is treated upon in these pages.

The leaders in photographic art, be it remembered, consider most carefully the trimming, mounting and framing of their productions. Witness the elaborate treatment of F. Holland Day's work, the unique surroundings by which Mrs. Käsebier enhances the intended effect, or the thoughtful handling of Alfred Stieglitz's pictures. And, occasionally, remember the proving of the rule by its violation—I have in mind an exquisite thing by John Bartlett, done nearly to death by a poor mount and a thoughtless and inharmonious frame. The poetic treatment of the lily-of-the-valley subject — a most difficult subject, too — was almost overshadowed by the unfortunate environment. In the Philadelphia Salon of 1900 hung a beautiful bit of a seascape by Robert S. Redfield—a mere "thumb nail" picture, the thorough enjoyment of which was made possible by its mount and frame.

Uncounted thousands of photographs have failed to give the pleasure their maker intended because the uninteresting portions were not trimmed away. Other thousands, well trimmed perhaps, have been ineffective because of inharmonious mounting; and improper or unsuitable framing has likewise slain its thousands! And, without going further into decimals about it, I am sure that many a negative has been discarded by the careful photographer because it has been considered as a whole only, and the really excellent bit hidden in it somewhere has not been isolated. It is, thus, with every consideration in support of the proposition to treat these truly important matters with proper care, to consider them essentials to success that I take up the detailed discussion of the subject.

Necessity for Trimming. The various plate sizes—as 4 x 5, 5 x 7, 6½ x 8½, 8 x 10, and so on—are not in exact proportion with each other, as any one may determine who will lay off these dimensions with the bottom and left sides together, drawing then a diagonal line from the lower left corner to the upper right corner. A composition, further, on the ground-glass, may not be proportioned exactly to the size of the plate which is to be used for it. Further, and frequently, the main object to be included in a view may have undesirable and obtrusive details near it, when the composition is made. Upon the thoughtless plan of printing the whole of a negative always, these useless and often objectionable details are included, and the really desirable portion of the picture obscured and overweighted. It is seldom that a landscape, for instance, composes so as to properly fill the plate on which it is to be photographed. There is the additional argument of the desirability of a relief from the monotony which results when all prints are of a uniform shape and size, but this is not concerned with the main reason for trimming—the presenting of the best of each picture only.

The well-known, but now fast disappearing, "album" of the middle ages of photography always provided one set opening for a print, and thus agonies were perpetrated. The more modern album, with its refined gray leaves, permits the mounting of prints of any size or shape agreeably.

Given, then, the desirability of thoughtful trimming, the methods and means are to be considered. The photographer who works intelligently has always a purpose in making an exposure—he knows what he saw to photograph, and as he has not the painter's facility of simply omitting obtrusive details, he tries to place his main object as favorably as possible, and uses the knife freely on the print when it is made.

Experiments in Trimming. Let us take a photographic print and consider it thoughtfully. Perhaps it is an ordinary landscape, the larger item in which is a clump of trees at one side. We take four pieces of paper or card (or better, two pieces cut into the form of a carpenter's square, giving us right angles) and proceed to lay them on the print, shutting off from view a portion of sky or foreground, or of the right or left sides. Moving the cards thoughtfully, always considering the main object of the picture, we are apt to see that by this process of experimental exclusion the true point of the photograph is brought out strongly. This indicates at once the extent of trimming required for the subject in hand. There are certain accepted dicta of the relative proportions of sky and foreground which we may well keep in mind, although occasionally the rule is only proved by its exception—on the basis that we shall "prove all things, and hold fast to that which is good."

Selecting Points of Interest.

A landscape usually looks best when the horizon line is not seen as central. Either the sky or the foreground seems to require two-fifths or one-third of the visible space, the decision for the photograph depending largely upon the interest of either. A sunset view, for instance, has its interest in the sky, and two-thirds the width may well be left above the horizon. A sea view, on the contrary, is frequently full of the life of the waves in the foreground, and the sky is therefore reduced. When thus considered, look also to the right or left; perhaps the cruel knife may do more good service! A fine thing hung in a recent Salon was a sea view, showing a strip about 3 x 7 inches. As I looked at it, the artist, chancing by my side, disclosed the interesting fact that it was all that survived out of an 8 x 10 print!

Frequently the moving cards on your print do not give satisfaction while remaining on the same plane as the negative. Do not hesitate to trim a horizontal print to a vertical shape, or the contrary, regardless of the final size. Better a square inch of interest than a square foot of monotony!

Sometimes a figure may be cut vertically to some advantage, though this is always dangerous. Daring examples are extant—one is reproduced in this number of The Photo-Miniature. To trim trees on two sides is also dangerous, and always indicative of photographic limitations—and nowadays photography stands up to be judged as a method of expression, not subject to greater mechanical limitations than those which surround the painter's or the sculptor's art.

A most excellent way to acquire trimming experience cheaply is to operate on spoiled prints, of which, alas, we all have enough, I take it! Cut them up and down and across freely, and lay the selected bits on proper mounts, to study effects. Extend the study, also, to the works of the masters in picture-making, in an endeavor to discern the principles upon which they have worked, but never trim a print a certain way simply because some one else has done so. Know why, and you will become an independent, not a dependent, worker.

Ovals and Circles. The oval form presents many good points, and also helps frequently to cut off some bad photographic corners. A composition with many straight lines is apt to be improved by reduction to the oval form. A point of interest, also, is often substantially brought out by the oval. I know that some good workers have set themselves against the circle and the oval on principle* — or lack of it,—but others just as facile in the production of pictorial photographs have no hesitation in making use of either form, on occasion. The upright oval is more often proper than the broad ellipse, which seems to be sparingly available, and neither should be often used — it is again a matter of unfettered judgment. A wall hung with prints all trimmed to round and oval forms would be abominable; but an occasional one is a break in the monotony.

Having discussed the various forms of trimming, we may well take up the mechanics of the subject. Probably the oldest, simplest and nearly the worst plan for trimming is that of using a simple ruler and an ordinary pocket knife upon any convenient surface, with the liability to slipping, tearing and making of ragged edges always present, not to speak of the probability of a departure from true rectangular lines. Only the scissors is worse! There are numberless trimming boards on the market, of greater or less efficiency. Being usually cheap, few have knives of even temper or regular edge, and few indeed present any means of squaring the print.

Squaring Prints. Right here let me stick in a pin, in the way of a warning as to squaring. Sometimes the tripod is not level, and there is a tip from the horizontal in the negative. If it is a tall building, falling together at top from careless leveling of the camera, there is no hope; better break the negative, unless it is important enough to be squared by means of a positive and negative, through a complicated process. But a simple dip in the landscape is usually remediable in the trimming if there is a horizon line, that gives the base to work from; if not, and vertical lines are present, square to the most important of these. If the vertical lines are "out," endeavor to minimize the bad perspective by permitting an imperceptible leaning at both sides, but do not trim right up against a defective vertical line. At sea, particularly, owing to the motion of the vessel, bad dips from the horizontal appear on negatives. Many careless or obtuse workers trim without thought, and offend every accurate eye by improper lines.

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* Wisely, I think, as one may see by comparing a collection of oval prints with a similar collection trimmed in rectangular forms. The oval and circle are adapted to perhaps one subject in a thousand.—*Editor.*

Trimming Appliances. To my mind, the very best tools for trimming to rectangular forms include primarily a celluloid triangle of generous size, two or three bookbinder's or shoemaker's knives, and a trimming board of close-grained hard-wood. A sheet of "heavy plate" glass, a sheet of zinc or a sheet of "tar board," obtainable from any binder, may be used, although these will necessitate frequent sharpening of the knife. The triangle is outlined in Fig. 1, with certain improvements over the commercial article. The form of knives most desirable is shown in Fig. 2, but a good pocket knife, especially one with a rounded point, does very well indeed. Any knife used must be sharp, and kept sharp, if clean edges are expected.

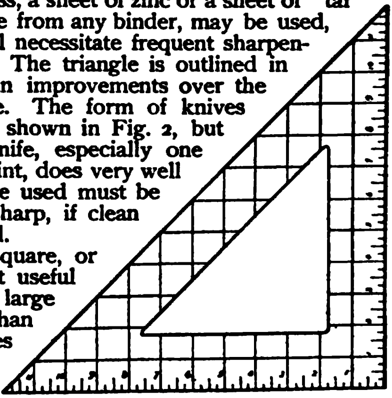


FIG. 1.

The celluloid square, or triangle, is a most useful implement. Get it large enough—not less than 8 inches on its sides for working on 5 x 7 prints—and then carefully graduate it for inches and quarter-inches, somewhat in the manner of a foot-rule, also drawing parallel lines one inch apart on its two right-angle sides. This can be readily done with a pointed knife or scratch awl, and the measurements may easily be obtained from an accurate ruler. Some time an enterprising maker will doubtless put *graduated* transparent celluloid squares on the market—at present one must do his own graduating. It is worth, however, all the trouble. In selecting a square, be sure to get one which really *is* a perfect right angle on its working sides. This cannot be taken for granted, but a test can very easily be made by means of a sharp-pointed pencil and a sheet of paper. Pointing the horizontal side of the square to the left, draw on the paper on which it rests a pencil line along the two sides of the right angle. Now reverse the square, and draw lines again, keeping the horizontal line exactly in line with the first one drawn. If the second vertical line does not coincide with the first, the square is not true, and should be rejected.

The great usefulness of this transparent square will be immediately apparent on trial, for it does not conceal any part of the print. One can thus work with ease, seeing equally well what is cut off and what remains. The further advantage appears that one is enabled, by a proper placing of the square on the print, to make two cuts before lifting it, with the assurance that they are at a right angle to each other. If the half-inch parallel lines are accurately placed, and the man with the knife has a "straight eye," it is soon easy, with a little practice, to make the two remaining cuts at the next placing of the square.

The celluloid square is particularly useful in trimming prints which have been made with a white edge by means of mats, as will be suggested below. A word of caution is in place here, regarding the use of the knife with this square, the substance of which is much softer than the cutting instrument—always turn the knife-edge slightly *away* from the square, so as to avoid cutting it. A little experiment and practice, and possibly a few nicks cut into the celluloid, will show the necessity for this care.

Printing with Masks.

We may now consider to advantage another method of trimming—that of selecting the portion of the negative we want to use in our picture, and printing it only in the form—square, oblong, oval or round—we prefer, by the use of suitable masks. By this means a white edge is obtainable for a print of any form, of such width as we may choose, and a very considerable increase in beauty is made possible for many subjects. This white line is not always desirable by any means, and it may very readily be trimmed away, but in many cases it is a great aid in the proper emphasizing of the point of the picture, especially when the modern dark mounts are used.

FIG. 2.

The width of this white line is easily regulated in the final trimming. It is often best as a mere line, no wider than the space between the parallel lines on the cover of this magazine, or it may be a quarter of an inch to advantage for some prints on some mounts. As a guide, it may be hinted that no lines, or but the faintest, will be proper for dark subjects, or those of a somber character, upon a slightly contrasting background, while the white may be increased to advantage for pictures of a lighter character upon dark mounts. Do not work upon a rule, but experiment, and use the margin which best suits the subject in hand. The new *Nicholson Trimmer*, giving a white marginal line of uniform width, is a convenience which deserves mention here as simple and efficient.

Prepared Mats. An assortment of masks or mats, with accurately cut openings of various shapes, is a most useful accessory in a printing room. The square and oblong openings may be cut out of orange "post office" paper, or heavy bond paper, by any one with a sharp knife, an accurate square, a good temper and much patience—the latter two being especially needful for the corners, which must be cut clean, without crossing the cuts. The oval and round shapes are out of the question without brass "forms" or dies. I have avoided a waste of either patience or good temper by obtaining the *Karma* mats, made for all sizes, from 3½ x 3½ to 8 x 10, at a trifling cost. The smaller sizes come in assortments which include some "freak" shapes, but these are easily thrown away. The ovals are symmetrical, and with the various shapes prepared for 4 x 5, 4¼ x 6½, 5x7, 6½ x 8½ and 8 x 10 plate sizes, one is ready for any part of any negative.

By obtaining two mats of each of the rectangular openings, and carefully sliding these over each other on the negative, the long and narrow panels may be readily made. But, beware of the fatal facility of the commercial mat, and cut your own wherever it will give an advantage.

In using the masks or mats, the one selected is laid on the negative, which is then held up to the light. The mat can be readily moved about until the desired portion is included, when the negative may be laid in the printing frame and the sensitive paper placed on top of it. The use of these mats, by the way, presumes a printing frame a size larger than the negative, with a clear glass upon which to place the negative to be printed.

Unmounted Prints. Some makers of *Velox* and platinum prints keep them unmounted, flat. These workers will find the plan of printing to a desired shape by the aid of the masks a very good one. It gives the print a certain finish by no means present when the whole negative is printed, or when the print is trimmed down to the desired dimensions without the use of a white edge. As with other photographic manipulation, experience is valuable, and the worker will find additional pleasure in printing with masks as he becomes proficient in their use.

Mounting. With our photographs trimmed to dimensions and forms best calculated to properly include their fine points, we are ready to take up the matter of mounting. In the earlier days this was a very simple matter, for nearly all photographs were of the brown or purple tones obtainable on glossy albumen paper, and white cardboard was esteemed *de rigeur* for mounting them upon. If anything "swell" was contemplated, the white card had a gilt line surrounding the place for the photograph, and later various embossed forms came into use, nearly all, however, white only, regardless of the tone of the photograph. I well remember when platinum prints began to be made, that the daring innovation was introduced of a card mount, white on its face, to be sure, but with a tinted piece of paper just a little larger than the arbitrary dimensions of the print to be pasted on its center. This was the beginning of a happy change, for it seemed to hint that a photograph might endure the proximity of other than the dead white borders provided by the regulation card. One was expected then to mount the whole of his picture, trimming off nothing whatever, for the better class of mounts had "openings" of the exact proportions of the standard plate sizes.

The infusion of art principles into what but a few short years ago was deemed a purely mechanical process has given us now a host of rich tints and colors for mounting surfaces, as well as fostered a study of the principles of harmony and contrast. At the present time there are many fine materials available, so that no excuse can be made for faulty or inharmonious mounting.

The Principles Involved.

In considering appropriate mounting, on proper methods, it is well to have a look at the principles which underlie the work. Every picture, either in monochrome or otherwise, has some dominating tint or color. The photographic print on one of the ordinary glossy papers gives a predominating brown or purplish tone; the black, white and gray of platinum, bromide, *Velox* or equivalent papers are indicative of a range through the grays; the carbon prints are positive in their varied pigment tones; and the "gum" productions introduce any desired color. In any one there is but one ruling tone, and the proper mount for the picture must, to be permanently and truly satisfactory, either harmonize with this ruling tone, or agreeably contrast with it along the well-known lines of complement.

Contrast or Harmony.

Color contrast is difficult to manage, for many of us, and it is usually safer to cultivate first the sense of color harmony. Control of contrasts may well follow, and one can study the subject in every waking moment which can be spared from the grind for a living, without ever exhausting the possibilities. A ramble into the country, in winter, summer, spring or autumn, will teach much of contrasts and harmony of color, if the eye be but appreciative. The shifting play of color on surfaces of water, the values of reflected color, the hues of flowers and trees—observation of all things through the color eye and with the color sense—will tend toward a just appreciation, meanwhile vastly increasing the joy of living and seeing.

Mounting in Harmony. Taking first, then, the safe ground of color harmony, we find that a mount is indicated for a photograph which continues the predominating tint of the photograph. Simple and easy as this dictum is, it seems to miss comprehension thousands of times, as witness the mounting of a black platinum print on a brown or deep green card, or the placing of a purple-toned photograph on a pure gray mount. Both instances are familiar to all of us, and yet with the knowledge and practice of the principle above mentioned, neither error would be made. Take the pure black and clear white, with the intervening delicate gray half-tones, of a well-made platinum print, and a gray or black mount is at once indicated. Nevertheless, in two notable exhibitions, progressing as these lines are written, each of which shows pronounced development along art lines, the mounting seems to have been done in part at random; for in one an exquisite gray effect in platinum is jarred against a frame in dull oak, and numerous brown tones are hung on gray mounts. In this same splendid showing by an artist as proficient with the brush as with the lens, there appear some of the daintiest and most original mounting effects I have ever seen, wherefore I conclude that the errors arise not from carelessness at all, but from Mr. Eugene's apparent failure to comprehend the underlying principles which he subconsciously practices most of the time! His delicate effects in the use of Japanese papers are beyond praise, and only the occasional slip betrays a certain difficulty. Of the marvelous quality of the photographs exhibited—and unaccustomed observers hardly believe they are photographs — this is not the place to speak.

Safe Ground. Grasping this simple and elementary principle, that for harmonious relation between picture and mount the dominating tint of the former should be continued in the latter, the merest tyro has in his hands a safe and artistic method of procedure. If his prints are in pure platinum, or in any of the bromide papers—and if he is able in the latter to avoid greenish or brownish blacks—he is safe to use gray cards or papers of any depth. Does he make the lightly esteemed but beautiful blue-prints as an expression of some of his sky or sea negatives, he is safe on a dark blue surface, though just here a fine opportunity for using the contrast principle appears, which I will discuss further on.

If the *Velox* or *Dekko* has not worked to a pure black in the shadows, there is the resource of a greenish black or brown-black mount, or even a sage green, for a lighter surface. For general usefulness, I know of no mounting surface equal to the "Carbon Black," made by Collins. It seems to combine brown, black, and green sufficiently to suit all tones of platinum or bromide, and it will wonderfully warm and brighten a print otherwise unsatisfying.

Mounting Surfaces. There are attainable many superb dark tones and colors in regular mounting board, but the wise worker does not confine himself to these, by any means. It appears very early in the experimenting that the surface chosen to mount upon must not be glossy, because the gloss reflects light which needs to be absorbed, and thus takes from the attention due to the picture itself. This understood, there is wide choice of papers, those most easily attainable being the modern so-called "cover papers" used by printers for book, pamphlet and magazine coverings. The cover of THE PHOTO-MINIATURE is known as *Mouse-gray Manhattan*, and other fine grays may be found among the *Belgrade*, *Oriental*, and *Ruskin* covers, samples of which any live printer ought to be ready to show. In these same lines are other rich colorings, suitable for mounts for carbon and gum prints. The *Princess*, *Sultan*, *Defender*, *Homespun*, and *Herculean* cover papers, and certain "drawing" or "plate" papers will also be found useful.

For very light and delicate effects, rice paper, parchment, ragged or "deckel"-edged linen papers, Japanese papers and the like may be used, always keeping well in mind the desirability of thorough tone harmony between picture and mount.

Double Mounting. Sometimes two shades may be used on a mount, the one showing but a narrow border about the print. Thus a white, black, or gray edge may be given, the mounting paper being trimmed to a size but a little larger than the print, and the latter carefully placed upon it. This double mounting should not be done without a specific reason, lest it become simply grotesque. I have heard of an

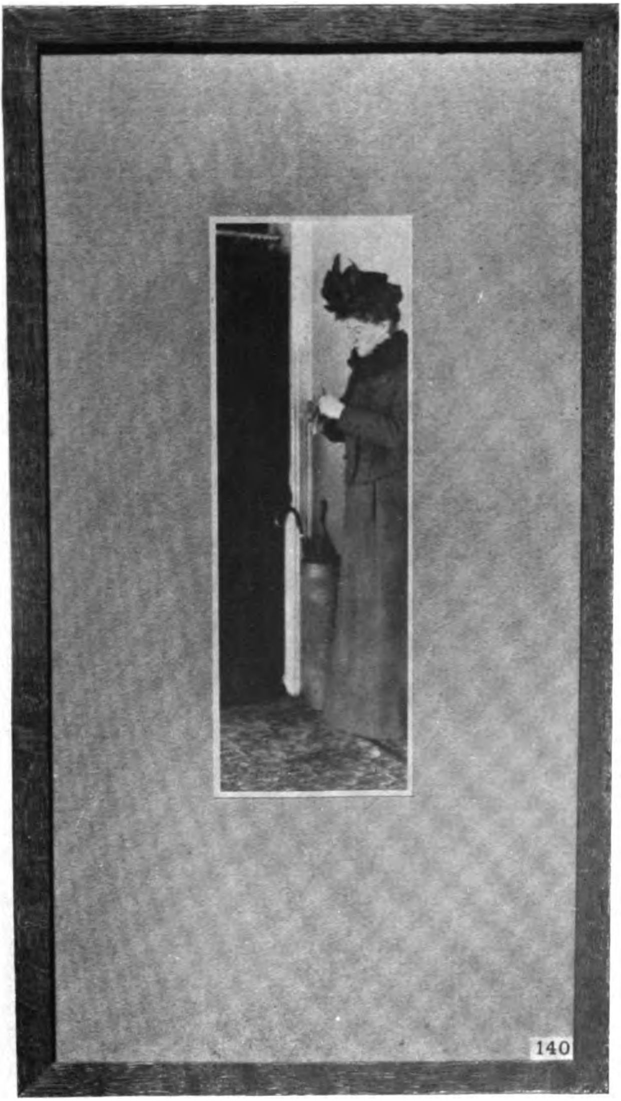
English worker who manages to use half a dozen pieces of paper of various colors to reinforce his picture, producing thereby a sort of paper specimen affair, utterly at variance with good taste or good appearance.

White Margins and Lines. Much consideration may well be given to the desirability of white margins on a print, and this can best be decided by trying the print, with a white edge, on the mount contemplated. This edge can easily enough be trimmed off if it seems undesirable. I have found it best, nearly always, to use mats or masks in printing, as before detailed, so that the print has a white edge which may be cut down to a mere white line, or left of a greater breadth. A subject with broad masses, in the sketchy style, will need more white margin than the delicate bits, in many tones. A good example of a proper use of the white margin is seen in Mr. Redfield's "The Glove"—which, indeed, is worth considering as a model from all standpoints of our subject.

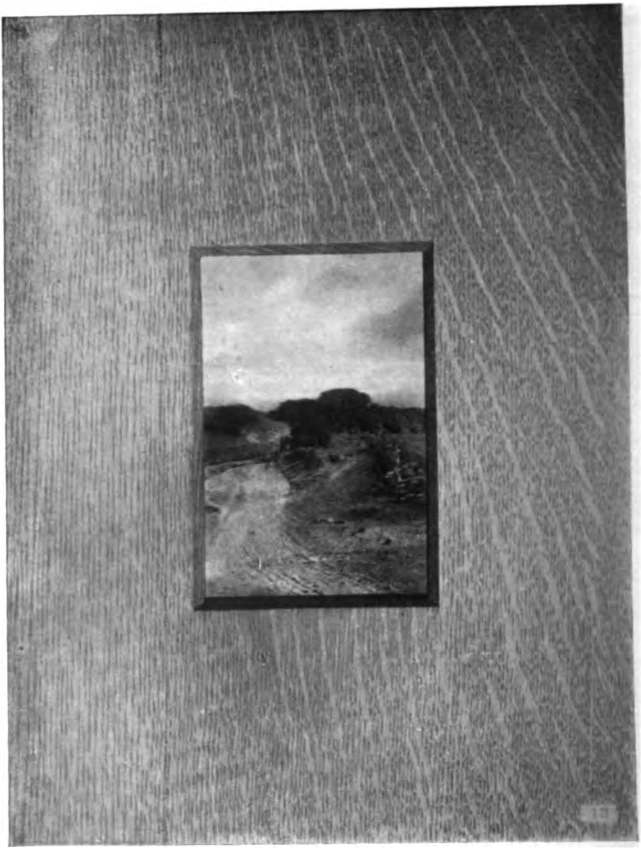
For black and white prints, there is often a fine effect produced by mounting upon a very dark gray, the print being trimmed so close as to show no white whatever, and a narrow white line being then drawn at say half an inch from the edge of the print by means of a ruling pen and some Chinese white. This plan is also particularly effective for combinations of several pictures on one mount, serving to give considerable unity of effect. A little practice is necessary to acquire the skill requisite to the making of a smooth white line, but that will not deter the earnest amateur.

In rare cases, with brown prints, and more often with carbons in red, brown, blue, and green tones, this line may well be of gold. Gold has no place, however, with black and white prints of any kind—they need to be treated strictly on a silver basis!

Panoramic Mounting. While on this subject of lines, let me speak of the mounting of panoramic pictures, now receiving some attention. If three distinct negatives, say, are carefully made from a given point, overlapping by a half inch at the point of contact, and if prints of equal strength are made from these, they may be trimmed so as to just match, mounted close together—not actually touching—on a dark board, and the joint visually obliterated by a strip of black paper barely an eighth of an inch wide, pasted right over the junction. It is practically impossible to *mount* panoramic pictures so that they will join successfully, though one may print them on one strip of paper by Mellen's method;



THE GLOVE
Robert S. Redfield, in Philadelphia Salon, 1900



AT SUNSET

F. C. Baker, in Philadelphia Salon, 1900 but in mounting separate prints the black line will take care of the junction, the eye simply disregarding it in looking at the three contiguous views, which are perceived as one. A white line, drawn as suggested, about the three will very much help the general effect.

Mounting Combination Pictures.

Akin to the treatment of panoramic pictures is the handling of combinations on the same mount. By a thoughtful and judicious consideration, these combinations may be made exceedingly effective and satisfactory. Long "strip" pictures, in which the various subjects are side by side, of a uniform shape; combinations of square, oblong, circle and oval, worked out so as to preserve the best points of each portion, often cutting away superfluous detail; upright strips, including several oblong views superimposed—these suggest only a very few of the possibilities along this line. I have in mind a very pleasant use of fruits and flowers in a certain dining-room, in which the oval form, sometimes in pairs, slightly overlapping, is successfully availed of. For all these styles, dark mounts are preferable. But the thoughtful amateur will only need a hint, and that given, he (or frequently a far brighter *she*) passes on to admirable achievements.

For combination mounting, the white-edged prints, provided as before suggested, are by far the best. Indeed, by a little careful measuring and preparation, the separate parts can be printed to just the shapes contemplated, and the best effects attained. Think it out first; work out your thought with due care.

Contrast Treatment.

Mention has been made of the possibilities of color contrast in mounting photographs. I approach this part of my subject with some trepidation, for it is ticklish ground. As I have before remarked, color *harmony* in mounting is safe and sure, while the treatment of color *contrast* is full of trouble.

Contrast treatment presumes at least a primary knowledge of the theory of complementary colors. If this was all, the practice would be easy, but it is not enough to know *which* color contrasts agreeably with your print—you must know *how much* of it is safe. More than just enough of the dark red paper which well backs up a snappy blue print will practically extinguish it. The exhibition walls of the day are full of dreadful examples of how to overdo the contrasting quantity, as well as miss the proper complementary hue.

Let us look at it in this wise: We want, in any case, to display the print, not the mount. Now, if the print be bold and strong, with vigorous contrast of light and shade, it will be benefited by a strong backing in the mount. If the picture be delicate in tone, and with fine detail, it will need careful handling in the tone of the mount. It is safest to keep away from the brighter contrasting colors in the mounts. I have seen a Bartolozzi red print made richer and stronger by just enough of a deep green "raw silk" paper backing, and alas, only yesterday I beheld a delicate portrait in sienna brown swallowed up in a greenish slate color!

I think this whole matter of the mounting of photographs in contrasting colors may be referred to the domain of experiment. If what you try looks well and satisfying, the print predominating over the mount, and the one who looks is not color-blind, it is a success.

Don't hunt for good *color* contrasts to black and white pictures, for none exist. Black contrasts with white, and harmonizes with it as well, and between lies the whole gamut of grays. There are grays and grays, however, and neither a blue-gray or a green-gray will happily back up a pure black and white print. The clash is not quite so violent as that presented this morning, when my color-eye was jarred by a woman in a scarlet waist, surmounted by a crimson hat, and showing, when she twisted up a hunk of her gray skirt, a magenta petticoat!

Position on the Mount.

The question of position on the mount is one of importance. The old rule was to mount squarely in the middle every time. As in most properly composed pictures the weight is toward the lower side, the visual effect was as if the print hung below the center. Therefore, we have come to invariably mount sharply above the middle for most things, keeping the picture central sideways. Some workers—perhaps I may dare to say also some "faddists"—hang the picture in the upper left corner. They like it, and I suppose it is another case of point of view differing, but I have never heard a logical reason advanced for the practice.* To me it looks much as if the dreary expanse of unoccupied mount had been intended for something else—perhaps a calendar pad! Some others think straight lines of no importance—as witness the reproduction of F. Holland Day's otherwise exquisite Japanese bit, "Madame Yaco," in which the print is carelessly crooked on its tea-paper backing and the latter not quite horizontally centered on the mount.

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*The practice is a "matter of feeling" for which the need of a definite reason is not apparent.—*Editor.*

Proportions. The proportion of space for the mat, as compared to the picture, cannot be arbitrarily prescribed. A good writer on this subject from the English standpoint insists that the print and the mount should never be in the same proportion, and he cites excellent reasons for the rule he lays down; yet I have seen many pictures most agreeably mounted which did use the same proportion exactly for both print and mount. It is a question of individual feeling, which should be determined by experiment and experience, rather than by rule.

If one goes into an art gallery, he will see many oil paintings—most, in fact—framed without mats or mounts, close up. He will see water-colors so treated, and also framed with mats. He will hunt for a rule, and find none, but may easily note that large canvases are usually framed close up, that water-colors in strong effects are likewise without mats, while the smaller and more delicate water-colors are apt to have a more or less broad expanse of intervening mat surface.

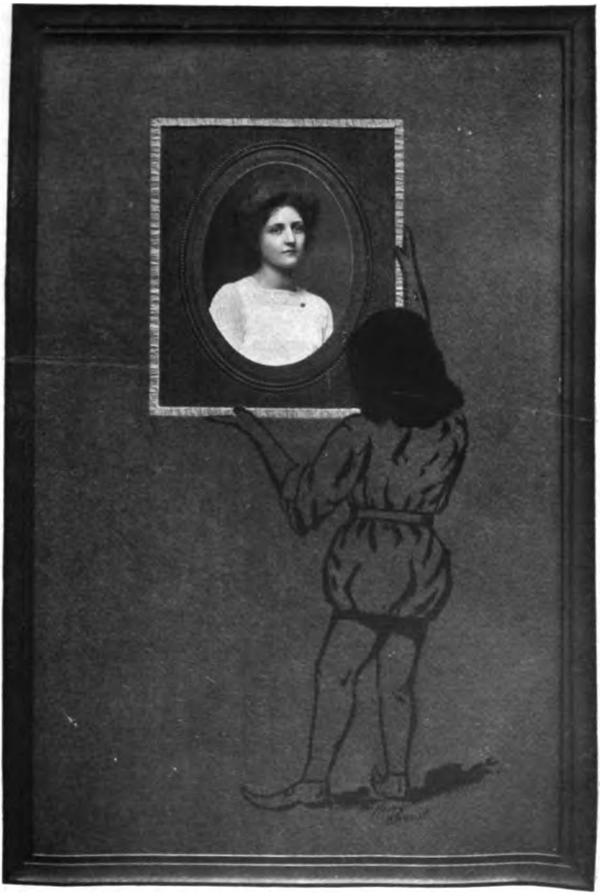
The inspection of works of art in color can only give a comparative aid for the treatment of monochromatic pictures, as photographs and engravings. Most prints of any sort seem to be helped in effect by a mount; and as I have said above, the width of this mount is very largely a matter of individual preference. Also, it is actually a matter of fashion, as any one will agree who has observed the tendencies shown at the various notable photographic exhibitions, which may be fairly taken as indicating the progress of the art. We saw only two years ago a tendency toward close framing, without mats, and with very wide frames which were really mats in effect; and the tendency ran to grotesque things in the way of diminutive pictures for ponderous frames. In this expiring year of the great century of progress, mounts or mats have grown and frames have decreased, and we see more than a foot of mat to display not much over a square inch of picture, the whole held together by a mere thread of a frame.

As usual, the true course is always moderate, and always thoughtful. The worker of understanding mounts and frames a certain way, not because he sees some one else do it, but because he finds a desirable effect attainable by his method.

It may be confessed that the extremists in the use of large mounts gain for their pictures much attention, because the wide expanse of mat surface, if properly chosen, tends to separate and isolate the print. If it be strong enough to stand isolation, well for it!

Mountants. Returning to the details of mounting, a word or two about mountants is desirable. If we work with heavy platinum papers. or carbon or gum prints upon substantial "stock," the prints may be simply hung on the mounts, by applying at each corner a very little good paste, and immediately giving a strong pressure, maintained until the print adheres firmly. This point of pressure is important, for with a strong pressure, applied at once, and held long enough to allow the paste to stick, we may do with very little paste, and avoid any cockling whatever. If the paper of the print is thin, and especially if it be at all curly, the print will require pasting down solidly. Ability to do this successfully is easily acquired by a little careful practice. In the first place, "any old paste" or mucilage will not do. We need a chemically neutral mountant, clean, soft and free from lumps. Fortunately there are now attainable several admirable adhesives especially adapted for this work, and I attempt no directions for making paste, which is about as foolish for the tyro as making dry-plates would be. Get a recognized white mounting paste, and a good flat bristle brush—a 25-cent varnish brush will do very well. As the paste you buy has as little water in it as possible, and that little would be greedily absorbed by the dry paper of the print before there was any chance of having it stick to the mount, it is necessary to first dampen the back of the photograph, until the paper is limp. Rub it gently with a damp sponge, or the paste brush dipped in water, keeping it face down on a sheet of glass (for cleanliness), until it is limp. Now brush the mountant into it vigorously, using your other hand to keep the edges down, and being very careful to get these edges well pasted. A little paste, evenly rubbed in, is best; too much will only cause trouble.

Details of Mounting. Having marked on the mount previously by pencil spots or pin pricks the position decided upon (two marks at the top, one at the left, will do very well), the print may be lifted from the glass, and its upper edge so placed as to just cover the marks, meanwhile keeping also an eye on the side mark until it is just covered. Rub the top of the print gently with dry fingers, to locate it there; follow it along down through the center, rubbing lightly out toward the edges. When it is all down on the mount, and in the correct place, lay over it a clean blotter, or a clean muslin cloth, following up with a print roller if you have one, or with the fingers if they must be relied upon. The object now is to get out any air which may be imprisoned



PORTRAIT DECORATION
Harry C. Knouse

TWO ROSES

J. Horace McFarland

under the print, wherefore we work sharply from the center outward, either with the roller or the fingers.

When mounted, the print may be made to dry comparatively flat if kept between dry blotters under heavy pressure for several days. Or, it may be sprung backward, and thus wedged between two book tops until dry, when it will come nearly straight. The cause of "cockling" or rounding of the mount is the contraction of the paper of the print as the water of the paste leaves it. If a perfectly flat mount is important, mount *on the back* of the cardboard another piece of paper as heavy as the print, and dry between blotters.

If the prints are to be framed, it is entirely unnecessary to mount them tightly. "Tipping" at the corners, carefully done, will answer perfectly. Some of the "faddists" hang their thin prints only by the top edge, and leave the lower edge to curl and flap at will. This *may* be called artistic by those who so esteem anything they can't give a reason for; but it is not neat, to say the least. Photography *is* progressing, or we wouldn't see these art-excrescences of the mere imitators hung among the really artistic productions of those workers who unite true knowledge and real feeling.

Prepared Mounts. In general, the prepared mounts, embossed with various designs, are best avoided, for they tend to attract attention from the picture. Some mounts, prepared with openings for pictures of various dimensions, and beveled so as to show a white line, are useful and convenient. In the best of these the print is simply slipped between the front mask or mat and the back, and "tipped" in position. Collins makes mounts with rectangular openings for prints of any desired size, which show a white beveled edge next the print, the surface of the mount being of any of the rich colors used for this purpose.

Decorated Mounts. One example is shown among the reproductions in the present number of THE PHOTO-MINIATURE of a decorated mount. The idea which Mr. Knouse has touched upon has many interesting possibilities to the worker who can sketch, or whose artistic friend will help him out. The example shown was a brown-toned portrait, the mat being deep green, with the sketched figure and the frame in black.

The discriminating worker will see in these hints upon mounting more of suggestion than of direction. I want merely to point the way, for an intelligent and tasteful experimenter will only need the finger board.

Cut-out Mounts. It will be noted that I have not gone into the making of the familiar cut-out beveled-edge mats for several reasons. To do the bevel-edge cutting-out requires special tools and special skill, which the progressive amateur will hardly care to acquire for an occasional need. He can easily get the cut-out mounts from a frame-maker if he wants them. Elaborate directions for the home production of these mounts may be found in Lambert's useful little book on "Mounts and Frames."

Framing. With the preceding brief discussion of trimming and mounting, we are now "up to" the framing problem — and frequently it is a difficult problem, too.

The frame is simply a mechanical accessory to the picture, providing a means of holding the objectionable but necessary glass which protects the face of the print from dust and soiling. It may, under intelligent treatment, become also an artistic accessory, enhancing the beauty of the picture; and it may, and very frequently does, detract greatly from the intended effect if improperly considered. In its simplest form, it is absolutely unobtrusive, serving only as a protection. In its best form, it very acceptably supplements careful work in trimming and mounting, tending toward the homogeneous and satisfactory whole. In its worst form, it fairly howls with disorder and inappropriateness, as may be witnessed in its connection with the department-store crayon enlargement, supplied free to the victim who will purchase the frame! In these cases, the frame is the main object of consideration, the thing or print — seldom enough truly a picture! — framed being purely incidental and secondary.

A properly mounted and framed picture of any sort, from the smallest photograph to a great battle-scene in oils, appeals to one as a whole, without the predominance of any of the subsidiary parts. It is just as with dress — the best dressed man is the one who makes no obtrusive impression as to clothes, but meets the eye as a satisfactory figure. We do not specially note, nor remember, as to the shape or color of the garments when they have done their duty of presenting the man in the best light.

I have seen many fine pictures, photographs as well as the 'productions of the brush, which have powerfully impressed me, but of the framing of which I have only a slight remembrance. These were well framed, and the message of the picture was not disturbed by its accessories. Conversely, I remember going to an exhibition in

New York of a number of water-colors of Venetian scenes and life by F. Hopkinson Smith, the first impression of which was most disagreeable, because of the glare of the wide gold mats which intervened between the pictures and their frames. Questioning an authority, I was curtly informed that "water-colors *always* have gold mats and gold frames, of course!" Pushing the inquiry, I got more "sarse," but no logical reason. It was simply another case of following a style once set, most suitable, perhaps, when first worked out in connection with a subject full of strong color in heavy masses, but very inappropriate for the delicate treatment of the versatile "Hop" Smith.

Later on, I had a chance to test my own theory as to the mounting and framing of a very perfect reproduction from one of the best of the Venetian pictures, and, as I look at it daily, no doubt appears as to the propriety of omitting both the "gold" mat and the golden frame. The foreground is sunlit, shimmering water, giving lovely olive shadows; the sky is the deep blue of Italy, with fleecy white clouds. The deep olive mat leads off to a dark greenish oak frame with just a faint trace of gold to relieve and brighten it. There is both harmony and contrast, and the result is an agreeable whole, with nothing to jar on the color nerves.

Principles of Framing. The framing of photographs rests on just the same principles as the mounting does, and all I have said as to the use of harmony or of contrast in relation to the mount, applies perfectly to the framing. If we trim ever so carefully, mount ever so appropriately, and frame improperly, the effect of the whole is poor — the picture does not fully deliver its message.

Very many tradesmen who make frames upon order have no sort of knowledge as to the principles involved, and hit upon good results occasionally by chance only. The most of these think gilt frames are the sum of elegance — the more gold the more elegance! Of late years there have been introduced a very great variety of frame moldings, including many in black and in gray, which make possible superior effects. If one will keep in mind the necessity for harmony, selection of a proper frame material will not be difficult.

Black and White Subjects. For black and white photographs the black and gray oak moldings are particularly good. If the combination seems somber, or dull, a narrow silver lining, next the print, will do wonders. Many good moldings have the necessary trace of silver incorporated in them. For some prints nothing is better than a simple dull silver strip, barely a half-inch wide, this doing best when set against a rather wide expanse of dark-toned mount.

Close Framing. As previously noted, the fashion of using a proportionally very wide black oak frame close up against a platinum print is going out. Framing "close up" is admirable sometimes, and abominable when done merely as a fashion, without reason. I think every fashion—perhaps even the long skirts used by ladies to sweep dirty streets nowadays!—has had its rise in some rational use, and its abuse is slavish following, without reason. Be that as it may, we can use the close framing method or not, as seems to best fit the subject in hand, not because this or that prominent worker has adopted it. Large heads, or half-length portraits in the Rembrandt lighting, seem to demand this close framing, and the effect is better when the molding is deep,—curving in toward the picture so as to simulate distance or depth. It is almost essential, for successful close framing, that there be no great difference in color and tone between frame and picture. Strong color contrasts will be ruinous.

It is seldom that a picture abounding in light looks well when framed "close up." In such a case the contrast is too violent and obtrusive.

Brown Prints. For the browns of silver printing-out papers, of toned platinum and of the gum-bichromate fad of the day, there are appropriate moldings accessible either in tones of oak or in the natural walnut. With some care, black frames may be used also, and occasionally a dark green molding will contrast very acceptably. A brown carbon is matched by a darker brown-stained oak, and if the picture be of any size, a trifle of gold will brighten it, just as silver does the black frames for platinum and bromide. A frame entirely of gold molding is seldom truly satisfying for any monochrome, the yellow hue of the precious metal seeming to find its best framing use in connection with broad masses of color, either in oil, water, or other polychromatic medium. The exquisite $2.98 frame of dubious gilt which surrounds and fortunately extinguishes (mostly) the high-class cabinet enlargement, "crayoned by hand," as provided by the big store as a premium for the purchase of a dollar's worth of soap, sugar or muslin, is a thing by itself, amenable to no art principles. It serves a most useful purpose as a dreadful example, however.

Making Wooden Frames. It will be seen that I do not enter into directions for the home production of wooden frames. This, as with bevel-edge mat cutting, is a business by itself, and few amateurs have time or inclination to do a carpenter's work. Better go to the frame store, selecting your own molding, and insisting particularly upon clear, white—not greenish—glass. The average home-made wooden frame is apt to be homely and not handsome, and the frame-makers work very cheaply in most parts of the country. By insisting on the proper moldings and mounting boards, you can usually get artistic and satisfactory frames.

Oval Frames. Oval frames are not used so frequently, probably because of their expense. They are not within the powers of the ordinary frame-maker, and usually come in small sizes, with a tendency to much gold. If a suitable oval can be obtained, it is often very effective, and the fellow-worker who sees the pictures filling up his walls, as I do, longs for a few good ovals to break the many straight lines of the square frames. Round frames are in the same category, but are of less use than the oval.

The Passe-Partout. There are some frames, however, which can well be home-made. Of these the simplest is the form known as "passe-partout." This is admirably defined by the Century Dictionary as "a picture frame consisting usually of a pasteboard back and a piece of glass, between which a drawing or engraving is placed, often with a plain or ornamental mat between it and the glass, the whole being held in position by means of strips of paper pasted over the edges."
This familiar form is exceedingly useful for the smaller sizes, and does very well, also, for combination pictures of moderate size. It is easy to make, quite satisfactory if well made, and fully as durable in that case as the average wooden frame. If binding strips of the proper color are used, and the mounts are appropriate, the passe-partout is thoroughly artistic, having the great advantage of taking up less wall space, not to speak of its trifling cost and quick production. One may print the picture and complete its frame in a winter evening, by using some one of the developing papers as the medium.

Using Discarded Negatives. It is no sort of disadvantage either to note that the making of passe-partout frames permits the use of the glass, often covered as deeply with regrets as with spoiled emulsion, which has been rescued from the pile of rejected negatives. These glasses, when cleaned of the emulsion, are better than the average picture glass. There are several methods of getting off the emulsion, which, fugitive enough on a hot summer day when it holds a valued picture, is very tenacious of its support when worthless. If there are but a few to be cleaned, and hot water is plenty, a soaking will soften, and a brushing remove the film. If we would only all have the courage to melt off the stuff the very moment that development shows the failure of our hopes, picture-glass would always be plenty!

But for easy removal, and for any quantity, the best plan is the use of hot water and nitric acid. Let the spoiled negatives soak in a wooden bucket filled with very hot water, in which has been mixed about one-tenth its volume of commercial nitric acid. The film will be soon softened and may be readily cleaned off with an ordinary scrubbing brush, noting that the fingers ought not to get into the acidified water.

Making a Passe-Partout. In making a passe-partout, it is usual to cut a piece of mounting card to the size selected, and "tip" or paste upon it, in the proper location, the print to be framed. Then a piece of glass of the same size, and another ordinary pasteboard, also cut to the size of the mount and glass, are taken. Before putting the parts together, a means of hanging up the completed passe-partout may be provided by running a strong linen cord through the pasteboard intended for the back at two points, equidistant from the sides, and say two inches from the top. This cord may be knotted inside, after making it just a proper length to act as a means of suspension. A brass ring, hinged on a strip of thin brass, projecting through the back of the pasteboard, is a better device than the cord, and Dennison now provides these in several forms. Two rings should be used, mostly.

Binding the Edge. With the glass carefully cleaned on the side next the picture, the latter and its mount dusted off and inspected for any paste specks or other defects, the three parts may be assembled and the binding applied around the edges, over which it must be folded evenly and smoothly. This binding may be any strong and pliable material which will hold a proper adhesive. The Dennison people have a regular passe-partout binding, useful in the gray and black colors, put up in rolls of 12 yards; it is ⅞ inch wide, and coated on one side with a powerful but ill-tasting fish-glue adhesive. A pebbled paper form is also provided, which is good in white and black. These bindings are convenient and strong, but if one values his peace of tongue and taste, he will moisten the fish-glue with a sponge or brush, and not as if it were a postage stamp!

So-called "leatherette" paper, made in imitation of leather, can be had in many colors and in white, and it is excellent for passe-partout bindings. The white binding is sometimes peculiarly appropriate, especially when the mount is of ash-gray or a lighter shade. To use the "leatherette," cut it by means of a straight-edge into strips of one-inch width, and thoroughly brush into the paper side a good adhesive—Higgins' paste, or the like. Do not attempt to apply it until it is perfectly limp.

A good way to get an even edge on the face side of the passe-partout is to moisten or paste the binding-strip, lay it flat on a smooth surface, and then very carefully bring down on it the edge of the pasteboard, mount and glass, firmly held between the two hands. As soon as the strip adheres on one side turn another to the pasted surface, keeping in mind the necessity of having a perfectly even edge on the glass side. The end of the strip should not come at a corner, but midway.

When the strip is properly located, fold down the front edge very evenly and carefully, turning in the corners neatly. As experience is gained, it will be found possible to neatly miter the corners on the front. The back edge may take all the unevenness — the front must be smooth and even.

Any one who has bound lantern slides will have no trouble in making passe-partout frames, though he will need to work very neatly.

Long panels, showing a number of small pictures, related to each other, are agreeably framed in passe-partout. Sometimes these may well be worked one above another, forming a vertical panel. The size of THE PHOTO-MINIATURE page precludes the showing of some examples of this sort of thing, which I would otherwise have preferred to present.

The Cloth-Covered Frame. Another form of frame, very appropriate for many photographs, and by no means widely known, is one formed preferably of binders' board, covered with book cloth. There is no reason, of course, why a wooden frame should not be covered with cloth, but the advantage and beauty of the form, possibly original with myself, in which the basis is some form of binders' board, make it unnecessary to trench upon the excellences of the wooden frame. The cloth-covered frame is therefore flat, and it is somewhat of a hybrid between the conventional mat and a frame, because it continues the tone over a flat surface. Its extreme simplicity commends it, in that there is no interest taken from the picture when thus framed. Further, the flexibility as to color of this form of frame gives it an especial value. Book cloth may be had in almost endless colors and tones, and in a great variety of textures, so that one's feeling of appropriateness can be more nearly accommodated in this medium than in any other.

As I write I see on the walls various cloth-covered frames, illustrating their color adaptability. A fine trichromatic reproduction of a De Longpré peony study, in which the flowers are in deep reds, delicate pink and white, with yellow centers, the prevailing tone being crimson, is framed by three inches of dark maroon cloth, in pleasant harmony. A delicate picture of rare fungi by W. Hamilton Gibson, done in light orange for the main color, is successfully complemented by a dull Turkish-blue frame. A favorite blue-print, toned to a deep and rather dull blue, with two interesting figures as the whole picture, is framed close up in dark blue, the frame being beveled toward the center, and a single gold line relieving the broad blue surface, about a half-inch away from the picture; the whole effect being harmonious.

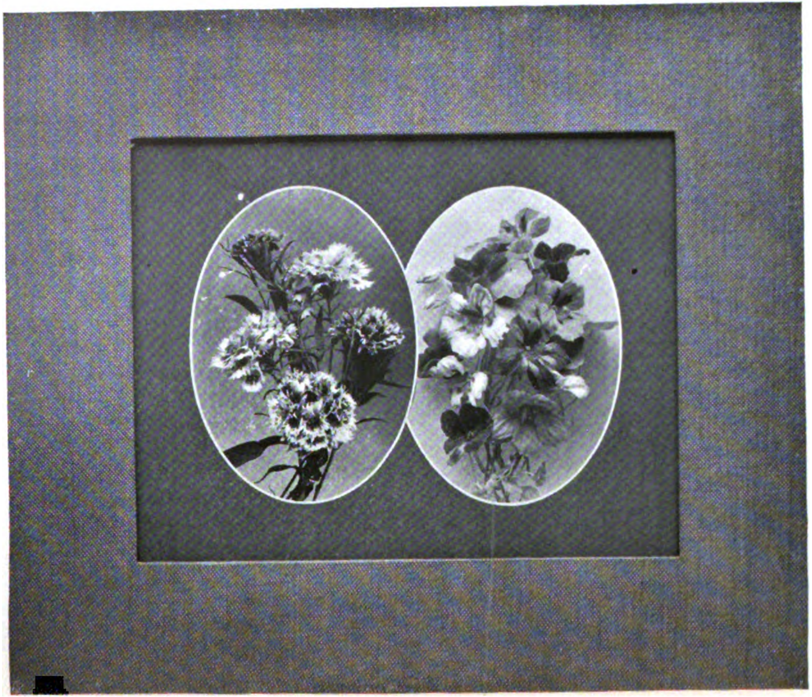
A brown etching-effect portrait of my old friend William Kurtz, the veteran artist and photographer, is held in a deeper brown frame, and a delicate line portrait of Paderewski, most charmingly worked in black and white by Gribayèdoff, is mounted in a gray frame.

I multiply these instances only to show the great adaptability of the cloth frame. One can hardly fall afoul of a color not readily matched or contrasted by an easily available book cloth. A splendid and rare portrait of Abraham Lincoln, done in coloritype some years ago, with a dark orange background, was a rank failure on the wall until I found its fitting enclosure in a yellowish brown cloth.

The shades of gray give perfect effects with platinum and bromide prints, and the varied tones of carbon and gum may be most agreeably harmonized or contrasted with a fitting cloth. Further, if the worker has any sketching ability, he can do remarque etchings on the frame surface to any extent. The cloth is quite durable, and may even be washed off, in the more subdued hues, without harm to it, save a dulling of its surface—and this is sometimes a benefit, rather than a damage.

THE PINES IN WINTER

F. A. Waugh



DIANTHUS AND NASTURTIUMS

Making the Frame. The method of making these cloth-covered frames is simple, but the work is best done by a book-binder, accustomed to the handling of the board and the book cloth. I will briefly describe the process.

In order to have the directions definite, I will presume we are making a frame to take a glass 6½ x 8½, which will agreeably take a picture printed on 5 x 7 paper, mounted on any suitable backing. (The 5 x 7 print may also well be worked in a frame with a larger opening; I am only taking the size mentioned as a convenient example.) We will have a frame 2¼ inches wide, speaking from the standpoint of picture-molding, and the net opening for the picture will be 6 x 8 inches, which allows ¼ inch on all sides for the "rabbet," in which the mounted picture and its protecting glass rest.

The "Face Piece." First, we cut a piece of pulp-board (a smooth board used for paper-boxes and for tablet backs) of fair thickness (that known as No. 50, in sheets 26 x 38, is proper, though any smooth board will answer) to the size of 10½ x 12½, having it exactly square. On this, purely for convenience in beginning the work, we mark out with square and pencil a rectangle 6 x 8 inches, representing the final opening of the frame. (See Fig. 3.) We will call this the face piece.

The Strips. Now cut two sets of strips from a heavier board, and of a better quality than the pulp-board. That known as No. 20, in size 26 x 38, of a good quality of "straw-board," will answer, though a stronger and somewhat heavier frame can be made from No. 18 "binders'-board," 23 x 29. In passing, it may be noted that a number of frames may well be made at once, and that the aspiring amateur who attempts to cut tar-board, or even straw-board, with a knife and straight-edge will have a warm and unique experience! Better by far get them cut on the "table-shears" of the nearest binder, who may also be expected to furnish the board; and I may be pardoned the hint that the same binder's scrap pile may well furnish the strips for the frames. The only care, if they are thus obtained, rather than by cutting from the full sheet, must be to have them of uniform thickness or "number." (The designating number of binders' boards means simply the number of sheets in a commercial "bundle," which always weighs 50 pounds; and obviously the larger sizes of a given number are thinner, a point which will explain some discrepancies if remembered. Straw-board is much lighter in weight, relatively to its thickness, and consequently much thicker in a given number, than tar-board or binders' board.)

The first set of strips for our frame are represented in Fig. 4; two are 2¼ x 12½, and the other pair are 2¼ x 6. These are for the first layer. The second set, made so as to allow for the "rabbet," and to break joints or corners, are 2 x 10½ and 2 x 8½, two of each. This set must be thick enough to equal the thickness of the glass and the mount; if not, a third set may be cut, of the dimensions of the first set, and it will add strength, as well as give a deeper rabbet. The whole matter of thickness and quality is relative; we need to get at least an eighth of an inch of depth in the rabbet, and any even board will answer. Wooden strips would do, but they are more trouble to work, far more liable to cockle and twist, and not so durable or inexpensive.

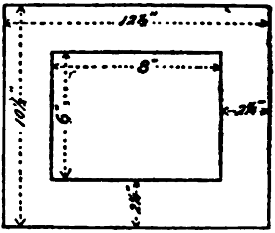


FIG. 3.

Back Piece. There may also be prepared a back piece of pulp-board or light straw-board, the same as the face piece, but one-half inch smaller each way, which would make it 10 x 12 over all. This is to enclose the picture.

Assembling the Parts. Now to the making, premising that for this work a slow-setting *flexible* glue is desirable—carpenters' glue is too harsh, and sets too quickly. Take the first pair of strips (A, on Fig. 4), brush them thoroughly with the warm glue, and lay them in position on the face piece, keeping flush to the top and bottom. Then glue and put on the smaller strips, keeping them even both inside and at the outer edges. It is important that the center opening is square, and the previously drawn lines on the face piece will help in placing the strips accurately. Allow the embryo frame to "set" for about fifteen minutes, having it on a smooth, flat table under an even weight.

Then proceed to glue and apply the second set of strips, which are designed to "cross corners" with the first set. This set, being narrower, and placed flush on the outer edges of the frame, provides the rabbet, and the appearance of the frame at this stage is something like Fig. 5. Lay it aside under pressure another quarter of an hour to "set," after which cut out the opening through the face piece, with a sharp knife—such a knife as shown in Fig. 2 will be suitable. The edges of the first set of strips serve as a guide for this cutting, which must be done smoothly, with clean corners—a "wabble" at this point will show very disagreeably in the finished frame. As the pulp-board is easy to cut, there ought to be no trouble in getting a smooth, even edge.

Rounded Edges.

It will be sometimes an advantage if the face of the opening is carefully and slightly rounded, which can be readily done with any scraping edge or with a shoemaker's rasp. When the opening is finished, put the uncovered frame away under even pressure to dry—it ought to stand over night. (My practice is to make up a number of the uncovered frames in various sizes at once, and keep them until ready to use, then applying any color or texture of cloth demanded by the picture to be mounted. Special shapes and sizes, of course, will need to be specially made.)

Covering the Frame.

Next comes the covering. Binders' cloth comes in rolls, and varies from 36 to 38 inches in width, the whole roll containing 30 to 40 yards. The textures found most useful are known as "Art Vellum," "Vellum de Luxe," "Buckram," etc. Any binder will have a sample book showing shades and patterns. Of course *any* cloth could be used for covering the frame, or any paper, for that matter; or it could be painted, gilded or enameled. The worker can turn his fancy loose—the cardboard frame is good material for his decorative ideas! But presuming on the practice of using binders' cloth, I say that we take a piece of it, cut a full inch and a half larger than the frame each way—13½ x 15½ would be the size for our experimental frame. Lay the cloth face down on a clean board, and brush into its back the hot flexible glue, working clear to the edges, but leaving a clean space of no certain area in the center, merely to save dirty fingers. The glued cloth should lie untouched for about two minutes to give it a chance to become evenly moistened with the glue, thus avoiding wrinkles later. Lay the frame face down upon the glued cloth, and very carefully draw the edges over the edges of the frame.

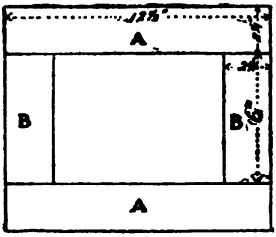


FIG. 4.

Now cut out the center, using a knife, and allowing something less than an inch on each side for "turn-in." The cloth when glued is quite flexible, and it must be worked carefully around the central opening, smoothing it down into the rabbet. The diagram in Fig. 6 will show how the corners of the cloth should be cut, after the frame is laid upon it, to facilitate folding. Inside, a simple diagonal nick will help the turning-in. In working on the face, use the hand only; to smooth the cloth into the rabbet, a bone "folder" or any similar round-edged tool may be employed.

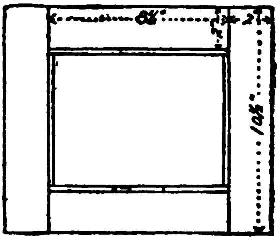


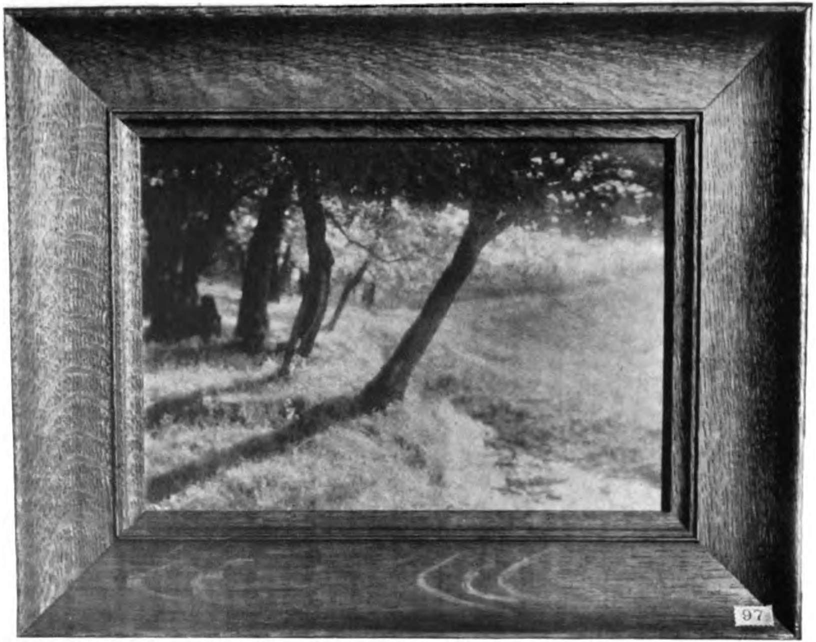
FIG. 5.

There is a procedure which practice has shown to be the best for this covering work. Referring to Fig. 6, it is as follows: *First*, cut the corners with scissors, as marked at C. *Second*, turn in the edges marked A. *Third*, turn in edges marked B, and nick the corners into shape with scissors and thumb-nail, working the cloth inside the rabbet with the "folder."

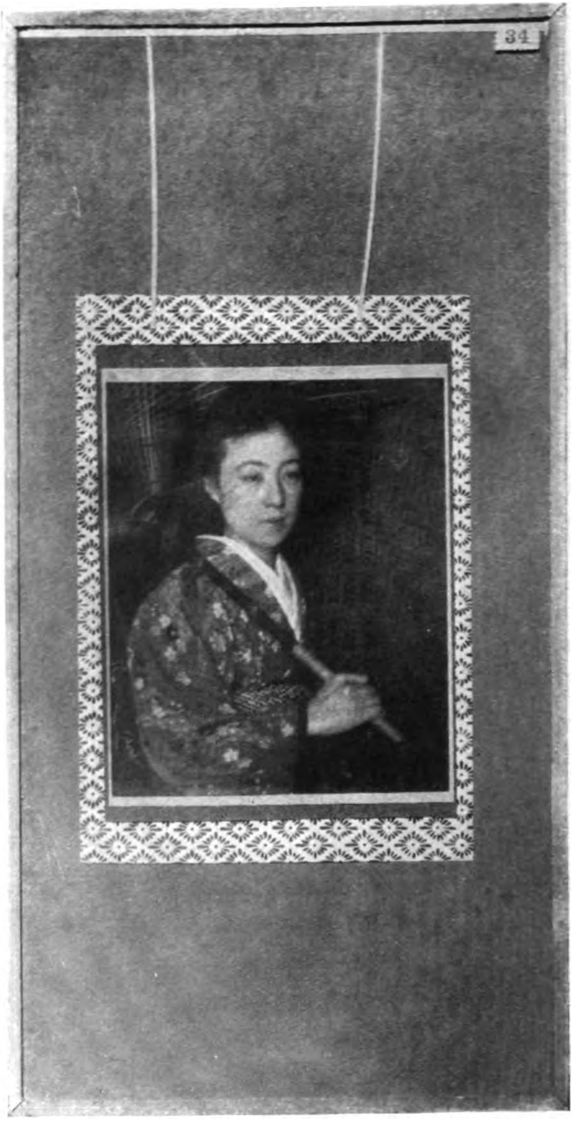
Framing the Picture. When this covering is done, the frame will look like Fig. 7 *on the back*. It is then ready for the glass and picture. The former should be carefully cleaned, particularly on the side to go next the picture, and both it and the picture laid in the rabbet, to which they may need to be fitted. A piece of paper should be laid over the back of the picture.

Now take the back piece formerly alluded to, and cut openings—mere slits—in it about 2 inches from the top, and from each side, through which slip a strong linen strip or cord. Paste down on this, *inside*, a reinforcing piece of strong paper or cloth. Then coat the back piece carefully with glue around its edges, and lay it on the frame with its picture, covering the turned-in cloth, and leaving a neatly even margin all around. Press this down, place it under a moderate weight until dry, and your picture is framed.

These frames, when properly made, are artistic, light, very durable, and by no means expensive if prepared in batches of half a dozen or more at a time. I believe my development of them is original, and I have been urged to patent the device; but as I have received most freely



LENGTHENING SHADOWS
Alfred Holden, in Philadelphia Salon, 1900



MADAME YACO
F. Holland Day, in Philadelphia Salon, 1900

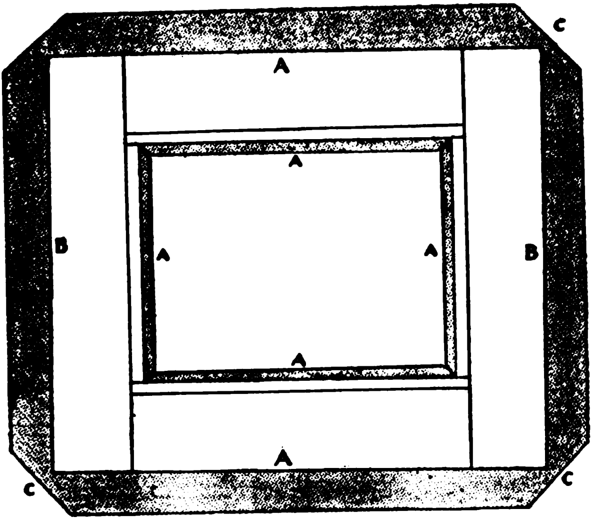


FIG. 6.

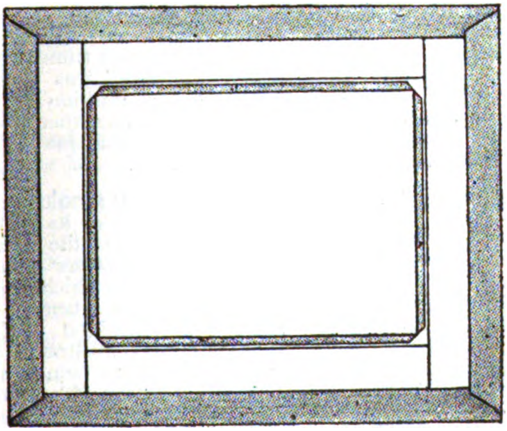


FIG. 7.

from the photographic world, I as freely give this little scheme, whatever its value. If some original (?) inventor, one of these days, tries to patent it, this first public description of the cloth-covered cardboard frame, suitable for holding pictures or diagrams of any character which can be mounted on paper or cardboard, will serve to give previous notice of interference!

In closing, it seems best to call attention to the special features which have led me to select the photographs reproduced as inserts in the present issue of THE PHOTO-MINIATURE. The frontispiece, a carnation subject, illustrates the use of the cloth-covered frame for close framing. The original is a brown print, and the cloth of the frame is a lighter brown.

The first insert, Mr. Redfield's "The Glove," illustrates a satisfactory method of trimming with white edges, with appropriate mounting and framing. Mr. Baker's "At Sunset" is a fine example of a harmonious effect in the use of a broad oak frame, without a mat.

A novel use of a decorative idea on a mount is shown in Mr. Knouse's portrait composition. The photograph is brown, the mount deep green, and the figure, drawing and frame are alike black. The child subject, "Two Roses," shows a good oval mount.

"The Pines in Winter," by F. A. Waugh, illustrates another use of the cloth-covered frame, and its companion, "Dianthus and Nasturtiums," also shows the same sort of frame, with oval printing and trimming.

Mr. Holden's "Lengthening Shadows" was framed close up in a deep oak molding. Its position on the wall prevented the obtaining of straight lines when it was photographed in the Salon. Mr. Day's "Madame Yaco" is a novel bit of mounting and framing.

In drawing this monograph to its end, it should be explained that the whole idea and purpose of its writer, Mr. J. Horace McFarland, has been to set the reader thinking and working along right lines, rather than to provide explicit direction concerning things which are so largely dependent on individual opinion or "taste." As far as the limitations of size have permitted in THE PHOTO-MINIATURE, Mr. McFarland has illustrated the principal points involved, these illustrations being gathered from his personal collection, together with certain examples from the Philadelphia Salon of 1900, reproduced here by the courtesy of the management of that remarkably interesting exhibition of pictorial photography.

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NOTES.

On the 29th of September last, the copartnership between John A. Tennant and William Edward Ward, forming the firm of Tennant & Ward, New York, was formally dissolved by the withdrawal of Mr. Ward from the firm. The business will be continued as usual, under the registered firm name of Tennant & Ward, by John A. Tennant, who assumes all the interests and obligations of the firm.

Thus far the formal notice. It is needless to say that I keenly regret this separation, which was necessitated by Mr. Ward's desire to take part in other ventures requiring his personal freedom. Mr. Ward and I have worked together most happily since we first joined forces in the establishment of THE PHOTO-MINIATURE with its allied interests, and it is quite impossible to express my appreciation of the enthusiastic goodwill and brotherly help which he has given day by day during these past two years. May all happiness and success attend him.

JOHN A. TENNANT.

❧

The popularity of THE PHOTO-MINIATURE grows as fast as the little magazine becomes known. We have been obliged to reprint No. 12: *Retouching Negatives and Prints;* No. 10: *The Blue Print and its Variations;* and are putting No. 9: *Lantern Slides* on the press for a new edition. The reprints of these numbers amount to 3,000 copies each. Since February last the regular monthly edition of THE PHOTO-MINIATURE has been over 5,000 copies.

As statements of circulation are usually considered debatable if not, indeed, largely speculative, those interested may make a note that we will be pleased at any time to put positive proof behind any figures here given.

❧

A Primer of Forestry. Part I. *The Forest.* By Gifford Pinchot. 2d Edition. 88 pp. 47 plates and 83 figures in the text. 5¼ x 7¼ x ⅝ inches. 1900. Government Printing Office, Washington, D. C.

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interest to students of forestry. It deals with the units which compose the forest, with its character as an organic whole, and with its enemies. Thus it is distinct from works on arboriculture, which treat of individual trees, rather than with trees which grouped together form a forest. The illustrations are from scenes in the United States, Canada, Switzerland and India, and are closely connected with the text, which latter, although necessarily technical in its terms, is vivacious and interesting.

◆

Doubtless every one who has mounted platinotypes on the popular *Rembrandt* card has experienced difficulty in preventing the mount from cockling. This is due to the thinness of the card. We are indebted to Messrs. Willis & Clements for the following method of mounting on these cards, which is guaranteed to give perfectly flat prints:

Things needed.—First: The print must be dry. Second: A ready-made paste, such as Higgins', Millen's or any similar kind, must be used. Third: An artist's bristle brush, ¼ inch wide, with which to apply the paste. Fourth: The print must be expertly placed on the mount, where it is to go, as by moving about much the mount will be soiled by the paste. Fifth: To insure uniform pressure, the mounted prints should go between two pieces of glass, the lower one of good size and the top one smaller and heavier—a piece of plate glass one-half inch thick is heavy enough. In place of plate glass one of ordinary thickness may be used and *weighted*, and if several prints are to be mounted at one time, as many pieces of glass may be used, piled up one on top of the other, only the top one must always be sufficiently heavy to insure the requisite pressure.

Directions.—Lay the print to be mounted on a piece of paper (we use newspapers cut to about 6 x 8 for cabinets or smaller sizes, and a *fresh piece for every print*) and quickly spread the paste along the four edges of the print, a narrow strip, about the width of the brush, using but little paste, and applying it evenly. Place the print on the mount and then at once under pressure.

This is the quickest, cleanest and surest method of which we have any knowledge. Keep the glasses clean, and when through mounting put the brush in a small jar or glass containing water. Be sure to clean off the old paste left on the brush from previous use.

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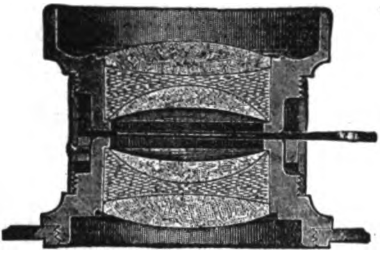

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A few days ago we spent a pleasant half-hour with Mr. F. Dundas Todd, editor of the *Photo Beacon* (Chicago), and were glad to hear of the wonderful success of the *Photo Beacon* during the year now closing. Mr. Todd has prepared a very attractive and helpful programme for the readers of the *Photo Beacon* of 1901, judging from which we may fairly say that the wide-awake amateur or professional can hardly spend a dollar more profitably than by subscribing for Mr. Todd's bright journal.

◆

The new printing paper which we described as combining the qualities of platinotype, carbon and photogravure, is at last in the market. It is to be known as Werner's *Mezzotint Carbon*, and supplies may be obtained from the inventor, Aloys Werner, 18th Street and 6th Avenue, New York, or from the Latimer & Legget Co., Puritan Bldg., Detroit, who have secured control of the sale of the paper.

According to our information, *Mezzotint Carbon* is a pigment process, but the pigment forming the print or image is the result of oxidation, and is not incorporated in gelatine as in the carbon process. The sensitized paper at present obtainable is Japanese vellum, and the cost of a 16 x 20 sheet is $2.50. Ordinarily the paper gives warm engraving black tones, but special paper may be had to order, giving sepia or brown tones when desired, or for special sorts of negatives. Mezzotint carbons are intended to be printed with a margin, and are not adaptable for mounting. The prints we have seen are very beautiful and peculiarly rich in tone, the shadows being remarkably transparent.

The paper prints about as quickly as platinum, but is not affected by damp or dull weather, as is platinum. It gives a visible image of a salmon-red color, and should be printed until the details are fully visible in the highest lights. The developer, which accompanies the paper, is brushed over the visible image, which gradually acquires the tone and depth desired. The print is next cleared in an acid bath (muriatic acid 1 part, to water 40 parts), washed for ten minutes in running water, and then immersed in a bath of glycerine 1 part, water 6 parts, for fifteen minutes, after which it may be quickly dried between blotters.

We go to this length in describing *Mezzotint Carbon* because it looks to us to be a most promising printing medium, and one which will be widely used for the best class of work by professionals and amateurs. In a later issue we will describe our personal experiences with it.

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By turning to the item *re Frobisher's Pyro Developer* on page 36, THE PHOTO-MINIATURE No. 13, and changing the word "sulphur*ous*" to read *sulphuric*, the reader can correct a blunder calculated to give the unwary considerable trouble and vexation. We regret the error, which arose, of course, from a mistake in transcribing the formula.

◆

The Forbes Dry Plate Works, Rochester, N. Y., send to our table a little woodland and water scene which eloquently proclaims the "color sensitiveness" of the *Forbes Orthochromatic Plate*. Looking at the print with its wealth of detail amid dark foliage, and its range of luminosity values, one wonders why the use of orthochromatic plates is not universal.

◆

Our Bird Friends. A book for all boys and girls. By R. Kearton; illustrated with 100 reproductions from photographs by Cherry Kearton. 5¼ x 7¾ in. Cl. $1.50. Cassell & Co., Ltd., New York.

We recently looked over the advance sheets of this work and have pleasure in making it known to our readers. Those who are familiar with the other three delightful books about birds and their photographing, written and illustrated by the brothers Kearton, will need no further hint. The present volume is written in an attractive style, and the pictures have been specially selected to interest the young folks. Unless we are mistaken, the series of photographs here presented is the best Mr. Cherry Kearton has thus far given us. It is emphatically a book for all (old as well as young) boys and girls.

◆

The Traill Taylor Memorial Lecture before the Royal Photographic Society, London, is this year to be given by Mr. F. E. Ives, of Philadelphia, on the subject of "The Optics of Tri-Chromatic Photography." We hope to give a brief account of the affair, which is to take place November 16, in our next issue.

◆

The McDonough Process of Color Photography, introduced in America by the International Color Photo Company, of Chicago, is enjoying a "boom" in England just now. *The Photogram* and other English journals are outspoken as to the practicability of this method, and

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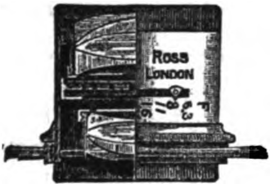

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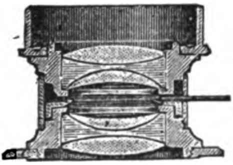

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the *News* predicts that "when the current wave of pictorial photography subsides, color photography will have its turn." Let us hope so. Meanwhile the new books on *Color Photography* by Bayley, Bolas Senior and others should be carefully read by those interested.

◆

A new lens, which has several notable features, is announced by the Gray-Lloyd Manufacturing Company, Ridgewood, N. J. The objective, which was calculated by Mr. R. D. Gray, of *Periscope* fame, is known as the *Double Stigmat*. "It consists essentially of two pairs of cemented lenses — each element being perfectly corrected. They may be combined to form either a symmetrical or an unsymmetrical doublet, or may be used separately as single lenses possessing the unique quality of rectilinearity. Thus the objective combines, in one instrument, three lenses of different focal powers, their values being approximately as 2, 3, and 5. The characteristic feature of the *Double Stigmat*, therefore, is that each element — the front and back lens respectively, is composed of two cemented pairs of lenses, which are separately and in themselves aplanatic and stigmatic objectives of unusual light intensity (speed capacity) and of unequal focal powers."

According to the claim made for the new lens: "Each element of the *Double Stigmat* will give a sharply defined image at full aperture (*f*/12); an image whose diameter is about equal to the focal length of the element; while with a medium stop the diameter of the sharply defined image is increased to about double the focal length of the element used."

Another characteristic feature of the lens is that "the cemented pairs of lenses in each element are contained in separate cells, with a screw adjustment by which the amount of their separation may be varied by the operator, who can thus secure any desired degree of diffusion or depth of definition at will." "Uniform diffusion over the entire field is produced by slightly unscrewing the interior lens in each element. By so treating only one element the diffusion will be more pronounced at the margins than at the center of the picture, as has already been pointed out The separate elements of the *Double Stigmat*, being corrected, may be used as single lenses practically rectilinear if not used as wide-angle lenses."

The *Double Stigmat* works at *f*/7.7, but when two elements of the same focal length are combined, a speed of *f*/6.3 is obtained. The great utility of this objective,

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which forms practically a battery of lenses, covering all ordinary needs, will be apparent to the reader. It is made in one series at present, No. 1 having a focal length of 4, 6, and 9 inches; No. 7, focal lengths of 12, 17, and 26 inches.

Further information, with a series of reproductions from photographs showing the working qualities of the *Double Stigmat*, may be had on application to the manufacturers, and the lens is one about which our readers should inform themselves.

* * *

The Burke & James Ray Filter Competition, referred to in previous issues, closed a few weeks ago, and the following awards were made from the hundreds of prints submitted:

FLOWERS.—*First:* W. F. Luick, 180 Ogden avenue, Milwaukee, Wisconsin; *Second:* C. T. Bush, Dubuque, Iowa; *Third:* A. W. Rice, Hayward, Alameda county, California.

LANDSCAPE.—*First:* Henry Fair, Lewiston, Idaho; *Second:* W. W. Bissell, 91 Main street, Rochester, N. Y.; *Third:* Gus. Horlen, 5127 Wentworth ave., Chicago, Ill.; *Fourth to tenth* (not arranged in order of merit): Robert D. Stevens, 40 Mahl avenue, Hartford, Connecticut; Arthur Anderson, Wahoo, Nebraska; J. W. McCaslin, 5747 Drexel boulevard, Chicago, Illinois; John B. Watson, Warsaw, Indiana; Charles T. Springman, 1024 Fourth avenue, Detroit, Michigan; Frank E. Foster, Iowa Falls, Iowa; Adolph Dittner, Fort Dodge, Iowa.

The judging was a difficult matter because of the large number of excellent examples submitted. In the *Landscape Class*, Mr. H. Fair's view (which we hope to give in a later issue) was a clever example of the discriminating use of a *Ray Filter*. As a general thing, however, the competitors seemed to have striven for abnormal cloud effects rather than for normal effects, in which they followed the general practice in the use of ray filters. In the *Flower Class* Mr. Luick secured the first award with a cleverly managed study of roses in which the blooms and the green leaves were well rendered.

* * *

Beginning with the new year our somewhat unwieldy contemporary *The Photographic Times* is to be reduced to standard magazine size, similar to *Munsey's*, and the subscription price is also to be cut from $4 to $2 per year. Notwithstanding, these changes the *Times* will be as pro-

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fusely illustrated as before, and the photogravure frontispiece will be continued. Mr. Walter E. Woodbury, its former editor for six years, will again edit the magazine, and in his hands the *Times* should speedily recover its old prestige.

◆

A new bromide paper, in five varieties, is being introduced by the Neue Photographische Gesellschaft, of Berlin, 7 West 14th street, New York. This paper has a high reputation in Europe, and we will report further after a practical trial of its working qualities.

◆

Photograms of the Year 1900. A Pictorial and Literary Record of the Best Photographic Work of the Year. Compiled by the editors and staff of "The Photogram," assisted by A. C. R. Carter. 6¼ x 10 x ⅞ in., 192 pp. 200 engravings. Paper covers, $1. Library edition, $1.25. Tennant & Ward, New York.

Photograms of 1900 is undoubtedly the most interesting volume of the series from the American point of view. This has been "the year of the American invasion" in England, and *Photograms* devotes liberal space in reading matter and illustration to the qualities of current American work, and the tendencies of the American school. This section is one which workers on this side will appreciate.

Apart from American work, *Photograms* gives illustrated critiques on *Artistic Photography in Germany*, *Australia*, *New Zealand*, *Canada* and *France*. *The Work of the Year* offers a racy review of the pictures exhibited at the English exhibitions, and the *Royal* and *Salon* exhibitions are separately discussed by A. C. R. Carter, who proves himself as helpful a mentor as the late lamented Gleason White.

The book is one which cannot be dealt with in the restricted space at our disposal. To the pictorial photographer it offers an inexhaustible store of suggestion and criticism of the highest value. To those simply desirous of becoming acquainted with what photographers all over the world are doing, or have done in the last year of the photographic century, *Photograms of 1900* is the most delightful, as well as the most comprehensive, of guides. The illustrations show decided improvement over those in last year's volume, and all concerned in the production of the book deserve great praise for the care and thoroughness with which they have done their work.

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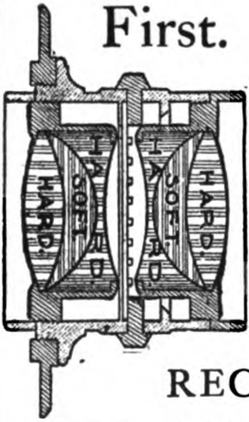

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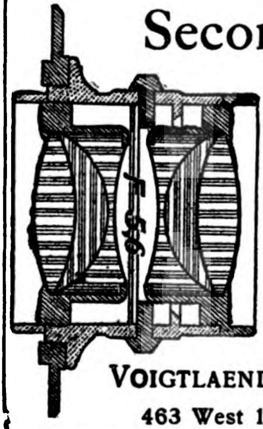

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Mr. H. A. Hyatt, 410 N. Broadway, St. Louis, Mo., has for years made special efforts in the production of catalogues and publicity matter of unusual attractiveness for the advertisement of his business, which is perhaps the largest photographic stock concern of the west. The new general catalogue, No. 15, surpasses all previous issues, both in completeness and appearance. In its 288 pages, the photographer will find described and illustrated all the best of photographic specialties, concisely arranged for ready reference, and tastefully printed. The assortment of backgrounds is exceptionally varied, and some very desirable effects are shown for the first time. A specially designed cover, printed in three colors, completes what may fairly be termed one of the most useful trade reference books of the year. A copy may be obtained by sending 6 cents (postage) to Mr. Hyatt.

◆

Neither care nor expense has been spared in the preparation of *Penrose's Process Year-Book for 1900*, the sixth annual issue, and if possible, the best one. The first impression on opening the book is that we have a volume entirely devoted to process illustrations, the forty articles, several of them of fair length, and some of them valuable, being swallowed up by the numerous supplement illustrations in half-tone, collotype or color. There are seventeen illustrations in color, by almost as many different firms, most of them examples of three-color work, a few being samples of special processes. A beautiful little vignette of an English hayfield, photographed by Eustace Calland, is successfully rendered into collotype by Bernard Alfieri & Co., this latter name incidentally showing what has become of one of the ablest workers of England's "new school" of a few years ago. The full-page "supplement" half-tones number 105, covering a wide range, from fine technical commercial work, through portraiture, to the reproduction of engravings, wash-drawings and pictorial photographs; and eighty smaller illustrations, many of them interesting adaptations to initials or tail pieces, are scattered through the book. The reading matter is somewhat different from the "usual thing." There is a cynical belief current that the average annuals pad their pictures with reading matter, and pad their reading matter with pictures. Mr. Gamble, the editor, deserves credit for the practical stuff he has drawn from his writers. A valuable historical article on "Photo Lithography in Half-tone," is contributed by Major-General Waterhouse; and Mr. Gamble's

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own article on "Catalogue Illustrations" is a *Miniature* in brief, and should be read by every photographic dealer who ever sorrowfully begins to compile a price-list.

The volume is bound in dull red cloth, stamped in black, with a special design by George Walton. It is a book which should be in the hands, not only of every printer and process engraver, but also of every photographer who takes a live interest in his craft or hobby.

◆

A few days ago we had an opportunity to watch a practical test of the capacities of the new *Lovell C. D.* (color differentiating) plate. The subject for the test was a peculiarly difficult lithograph from the pages of *Truth*, a portrait of a girl in yellow, blue, and carmine tints. The combination of color may be imagined. The first exposure was made with a plain (unorthochromatic) plate for purposes of comparison; then followed an exposure with a *Lovell C. D.* plate without color screen; this, in turn, was followed by a *Lovell C. D.* plate, backed, and exposed through a normal yellow screen. The resulting negatives offer indisputable proof of the superiority of the last named where maximum "color values" are desirable, but the second exposure gave a negative which showed that the *Lovell C. D.* is a valuable plate, even without a color-screen. And still the wonder grows why so many photographers keep on using color blind plates!

◆

Among the events of chief importance during the month *The Third Philadelphia Salon* easily comes first. By an unfortunate combination of circumstances our visit to the exhibition was made between two trains, with the result that the readers of THE PHOTO-MINIATURE will be spared a lengthy review of the 204 exhibits so carefully selected by "the jury of selection" from the thousand prints submitted for exhibition.

The *Salon* was held at the Academy of the Fine Arts from October 21 to November 18, and was attended by nearly 20,000 visitors. The jury of selection was composed of Alfred Stieglitz and Frank Eugene, of New York; Gertrude Käsebier, of Brooklyn; Clarence H. White, of Newark, Ohio; and Eva Lawrence Watson, of Philadelphia. Many of the pictures displayed on the walls were familiar friends seen at previous exhibitions here and abroad, but for the most part, these were sufficiently interesting to justify renewed acquaintance. Among the 204 exhibits there were many which, except

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from the "plastic psychological synthesis" point of view, were inexplicable both in choice of subject and method of treatment. But we were glad to see that the majority not only gave "distinct evidence of individual artistic feeling and execution," according to the declared purpose of the *Salon*, but also gave one a great deal of pleasure as pictures pure and simple.

There is likely to be considerable discussion during the coming year concerning the usefulness of the Philadelphia *Salon*, its advantages and disadvantages. We, therefore, take this opportunity to place THE PHOTO-MINIATURE on record as wholly in support of them ovement which the *Salon* aims to represent. That there is room for improvement, and especially need for broader and more catholic views in its management, cannot be denied. But it is also undeniable that the *Salon*, imperfect as it is in this or that, has accomplished great things in behalf of pictorial photography in America, has raised the standard of American photography along certain well-defined lines, and is an institution deserving of the enthusiastic support of those interested in the development of pictorial photography. However desirable certain reforms may be, therefore, we would urge that they should be effected with scrupulous care for the conserving of the magnificent work which the *Salon* management has already accomplished.

A brief description of some of the more notable works exhibited will be given in our next issue.

◆

Mr. Alfred Watkins, the developer and exposure expert, has just issued a meter for giving necessary exposures for indoor or very dull weather. Mr. Watkins' name is a guarantee of thorough reliability, and the price of his little meter (25 cents in England) will delight amateurs of limited means.

◆

Those who filter solutions, and almost all except gold, silver, and pyro, are better for it, will find a tuft of absorbent cotton of good quality quicker and better than filter paper. Put a wad of the cotton, not too tightly, in the bottom of the funnel. It will stop a surprising quantity of dirt.

◆

It is sometimes difficult to unmount a print. The secret is to attack it through the back. Lay the print face down on a clean glass. Behind it place a cloth, wrung out in

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warm water, folded three or four times, and exactly covering the mount; another piece of glass and a weight over all completes the arrangement. In a few hours the mount will be soaked through and the picture will strip.

◆

Dust on the lens often causes foggy plates. Cure is hopeless; the prevention is obvious.

◆

In *Camera Obscura* Mr. Chapman Jones asks, "What is a photograph?" There is more in the question than is apparent at first glance, for the term photograph merely means a picture produced by photography, and has no say as to the printing method. This latter effects the important question of permanency. We have so many papers now, and so many ways of faking them, that it is time we knew more as to the method; for even practical photographers cannot always say what paper has been used, after examining a print. Let us have the correct process indicated; and do not let us have fictitious names, such as "platinograph" or "carbonette," which are always intended to be misleading.

◆

To make a good mountant, beat two ounces of powdered starch into a thick cream with a little water. Heat a pint of water in an enameled iron pan, and when it boils drop the starch cream slowly and gradually into it, stirring all the time. Boil for ten minutes, stirring steadily, and allow to cool. When quite cold, remove the skin which has formed, and the paste is ready for use.

◆

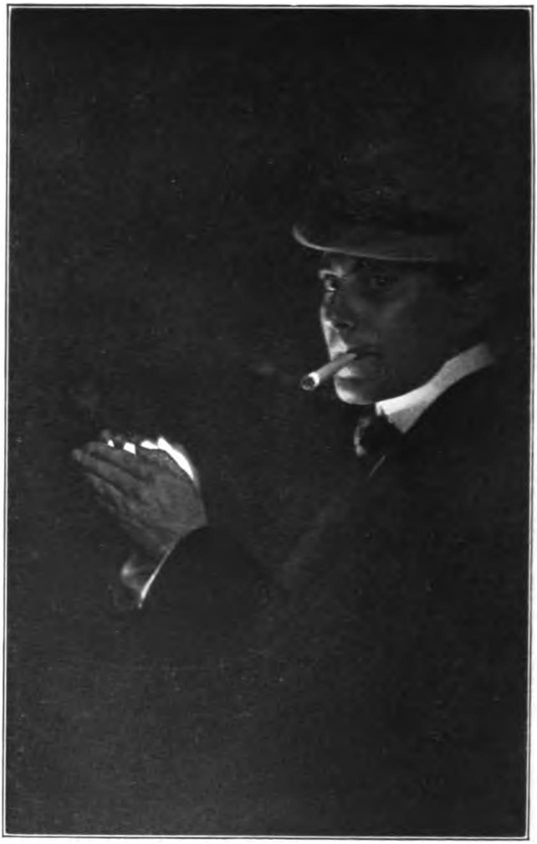
An exhibition of "pictorial photographs" by Holland Day and other Americans has been open in London some time and is now going "on tour." An English writer think the pictorial movement "too serious and definite not to be treated with respect, but perhaps too young to justify one's setting it above all others."

◆

A very weak solution of ammonium sulphide will reduce carbon prints if they are too deeply printed.

◆

Winter months are here, and a cold developer means slow work. Remember to heat the developer to about 65°. The negatives come up more quickly and the result is better.



MR. WILL ARMSTRONG

Henry H. Pierce

New England Salon, 1900

THE PHOTO-MINIATURE

A Magazine of Photographic Information

EDITED BY JOHN A. TENNANT

Vol. II DECEMBER, 1900 No. 21

ALBUMEN AND PLAIN PAPER PRINTING

From the beginning of photography, until perhaps fifteen or twenty years ago, more than nine-tenths of the photographs produced the world over were what are generally known as "silver prints." And although platinum, iron and "carbon" or pigment prints are now familiar everywhere, it may still be fairly said that the silver print leads all the others in popularity and common use. This gives us an idea of the importance of the silver printing methods, and suggests that it is time that we had a number of THE PHOTO-MINIATURE devoted to the subject.

There are silver prints and silver prints; so many, in fact, and so different in kind, that we have abandoned the generic term, and name our silver printing methods or prints after some peculiarity in manufacture or manipulation, or perhaps, more commonly, by a trade name made familiar by advertisement. Thus we speak of solar prints, collodio-chloride and gelatino-chloride prints, bromide, *Velox*, *Dekko*, and *Aristo* prints, gelatine, albumen and plain paper prints—all "silver prints," possessing different characteristics, and distinguished in practice by their names. Solar prints, for instance, were so called because they were made in a solar or sun-printing camera by which a large volume of sunlight could be concentrated upon a sheet of paper sensitized with iodide of silver. Today "solar prints" are made by electric light, but the name remains unchanged. Bromide papers are, of course, papers coated with a gelatine emulsion bearing bromide of silver. *Velox*, *Dekko*, etc., are modified bromide of silver papers. *Aristo*, in this country, is a trade name given to a collodio-chloride printing paper, and collodio-chloride or gelatino-chloride papers are papers coated with chloride of silver emulsified in collodion or gelatine.

Honor to Whom Honor. The first practical silver printing process was made known by Fox Talbot in 1839 (or earlier), some months before the world was roused by the announcement of the Daguerreotype process. This interesting fact may startle the gentle reader who has rested in the belief that Daguerre was *the* Father of Photography, but history attests its truth. It is pertinent to give here the brief description of this earliest of silver printing methods, as communicated by Fox Talbot himself in the *Philosophical Magazine* in 1839. He says:

"In order to make what may be called ordinary photogenic paper I select, in the first place, paper of a good, firm quality and smooth surface. I do not know that anything answers better than superfine writing paper. I dip it into a weak solution of common salt, and wipe it dry, by which means the salt is uniformly distributed through its substance. I then spread a solution of nitrate of silver on one surface only, and dry it at the fire. The solution should not be saturated, but six or eight times diluted with water. When dry the paper is ready for use." Further on he points out that the best results are obtained if the amount of silver is slightly in excess of the amount of salt.

This chloride of silver paper Fox Talbot intended for the making of negatives in the camera, but he also pointed out that it was suitable for the production of positives (prints) from negatives, and he says, just as the enthusiasts of today say of their papers: "Nothing could be more perfect than the images it gives," etc. Now this first silver printing paper which Fox Talbot gave us is practically the "plain paper" process in use today, concerning which we will learn more in later pages.

Comparisons. With the announcement of Talbot's discoveries came also the publication of the Daguerreotype process in France. Naturally, those interested in the new art compared the pictures produced by the two methods. And so we find M. Biot saying, in a communication to the Academy of Sciences, Paris: "It is not to be expected that photogenic drawings made on paper (Talbot's prints) can ever equal the clearness and fineness of those obtained on level and polished metallic plates (Daguerreotypes). The texture of the paper, its superficial roughnesses, the depth of the imbibitions, are so many obstacles to absolute strictness of delineation," etc. Following M. Biot, the great world gave its favor to the Daguerreotype with its infinite gradation of tones, its superabundance and delicacy of detail, so that paper printing methods made little progress until 1850, when Blanquard Evrard and Gustav LeGray suggested albumenized paper.

The First Albumen Paper.

According to their suggestion, paper was first coated with albumen (white of egg) and then made sensitive by salting and silvering on the lines laid down by Fox Talbot. This was the first "albumen paper," and gave prints rivaling the Daguerreotype in fineness and clearness of detail, the albumen coating preserving on the surface of the paper all the delicate tones and gradations of the negative image. Here, then, we have traced the beginnings of silver printing as we know it today, and we see, further, that the plain matt surface paper first introduced was put away in favor of the now despised glossy albumen, because the latter pleased the public taste of that time.

An Historical Note.

The popularity of albumen paper was instantaneous, and for thirty years after its introduction practically no other printing paper was employed in the general practice of photography. The reasons for this popularity may not be as apparent to the amateur of today as they were to the amateur of a few years ago. The paper could be obtained already albumenized, and even "ready sensitized" in cut sheets; its manipulation was simpler than the carbon process of that period; and the results it gave were altogether more attractive than those obtainable by the only other available methods, the iron processes (blue prints) and the then new bromide papers. Thus it came to pass that in the sixties and seventies kings and queens and "common people" were united in the simple faith that albumen paper was the best of papers wherewith to make photographs.

In the hands of experienced workers, indeed, albumen-silver paper yields prints not surpassed in beauty by any other sort of prints, exquisite in their delicacy of definition and gradation, and yet marvelously rich in tone and color effects. Now-a-days it is the fashion to rhapsodize over the tone qualities, and what not of Hanfstaengel's or Braun's carbons. They are, indeed, wonderful, and worthy of all praise. But I have seen albumen prints quite as delightful to the unprejudiced eye, and possessing all the qualities of the richest carbon, save, perhaps, that most desirable of qualities—absolute permanency.

The Revolt.

Whether familiarity bred contempt, according to the old saw, or whether photographers simply grew weary of the everlasting "silvering," "fuming" and other minor troubles of albumen printing, is neither here nor there. With the incoming of the new amateur came also a revolution in photographic printing methods. The amateur wanted something simple, and albumen paper did not meet his notion of simplicity. Almost every process suggested or devised since times remote was trotted out and displayed in turn. Every month in the year brought forth a new photographic printing paper. The conservative professional became restive amid the commotion and, recalling the accumulated miseries of years, left his ancient faith and followed the strange gods worshipped by the amateur. Almost before one could realize so tremendous a change, albumen paper had been largely put aside. In its place came chloride of silver papers under a thousand names, gelatine and collodion papers requiring neither silvering nor fuming, ready trimmed at absurd prices per gross boxed; platinotype paper began to be popular; carbon printing methods enjoyed a revival under various disguises; a host of bromide papers appeared, lending the convenience of printing by artificial light at one's own fireside; and even the iron printing processes were regarded with favor. A thousand possibilities, only dimly perceived before, became practical realities, and photography entered upon a new lease of life, and its use was greatly extended.

Present Conditions.

But all this is by the way. Out of these changing conditions have come many good things. After finding out many new inventions we have learned that albumen and plain paper are by no means to be despised, but, on the other hand, have virtues and advantages peculiarly their own. Here and there we find photographers who have never given up their old allegiance, and others who have returned to the use of albumen paper for certain purposes wherein the newer papers do not meet the requirements of convenience and efficiency. In commercial photography, of course, albumen paper has always retained its supremacy, and the revival of small prints, after the fashion of the old miniatures, has brought not a few to reconsider the possibilities offered by the structureless film of an albumen-silver print. The amateur worker will probably never take up albumen paper seriously, but turns his attention more and more to the plain paper methods as offering that freedom and simplicity which he seeks in his hobby. In this little book, therefore, I propose to give a plain account of both these old-fashioned but very desirable methods—for the information of the reader, and as a book of reference when interest or curiosity has been awakened.

Albumen Paper Varieties. Albumenized or albumen paper is a commercial article. Its preparation in small quantities is so troublesome that the reader is advised not to attempt it. Briefly, it is prepared as follows: *Rives* or *Saxe* papers—two specially made plain papers of great purity, uniformity and fineness of texture—are coated on one side only with an albumenizing and "salting" solution, composed usually of albumen, ammonium chloride (common salt or chloride of sodium is sometimes used), alcohol and water. This operation gives the paper a thin film of albumen discernible by its smoothness and slight gloss. Paper coated in this way is sometimes spoken of as "single albumenized." In order to obtain prints with an extremely glossy surface, a "double albumenized" paper is prepared by submitting the "single albumenized" sheet, when dry, to a current of steam, which coagulates and hardens the first coating of albumen. This paper is then floated on the albumen solution a second time. When dry "double albumenized" paper has quite a heavy gloss and is liable to crack and blister in manipulation. Be this as it may, the albumen paper most commonly used is "double albumenized," probably because it gives greater brilliancy and transparency to the print. The unpleasant smell given off by some brands of "double albumenized" paper is due to the use of fermented albumen in its preparation, a method which is said to give added richness to the prints. This "double albumenized" variety is preferred for portraiture, while the "single" may advantageously be used for landscape and large work. The "single" variety is generally less expensive in first cost, and less liable to "blister" or give trouble by reason of the varying temperature of the washing, toning, fixing baths, and after treatment.

Commercial Brands. There are many reliable brands of albumenized paper in the market, and the reader cannot err if he chooses either *N. P. A.*, *Steamer*, *Eagle*, *Three Crown*, or *T. & M.* paper. As purchased, the paper comes in sheets about 17 x 22 inches. It will "keep" any length of time if stored in a cool and not *too* dry place, well protected from sudden changes of temperature.

Preparations for Sensitizing. Before printing can be done the albumenized (and "salted") paper must be sensitized by being floated on a solution of nitrate of silver. In England and on the continent "ready sensitized" albumen paper may be purchased in small quantities as desired. In this country the reader must purchase his paper, unsensitized, a dozen sheets at a time, and find a professional worker who will sensitize it for him as desired. But the sensitizing is a very simple operation, and requires little in the way of equipment beyond a deep tray (10 x 12 in. for a quarter sheet, 15 x 20 in. for a half sheet, and 19 x 24 for a whole sheet); a dozen wooden clips, and a box for "fuming" which should have a well-fitting door. A few dozen sheets of blotting paper, a hydrometer, and a few wood strips two inches longer than the width of the sheet to be sensitized, with a wide-mouthed bottle for the silver bath, complete the list of apparatus required.

The tray used for sensitizing may be of wood (hard, close-grained wood, well varnished with a hard shellac varnish), rubber, glass or porcelain. A wooden tray will answer all purposes and is the least expensive. It is also rigid and more easily handled than rubber. Porcelain trays are easily handled and easily cleaned. Thus they are in every respect the best, although costly to replace if broken. If rubber trays are used they should be encased in a wooden frame as, with a gallon of solution in them, 19 x 24 in. rubber trays are difficult to handle.

The Silver Bath.

Now we take up the sensitizing solution, generally spoken of as the "silver bath." This is often the biggest difficulty in albumen printing, but it need not be a difficulty if the worker will once master the little carefulness needed here and there.

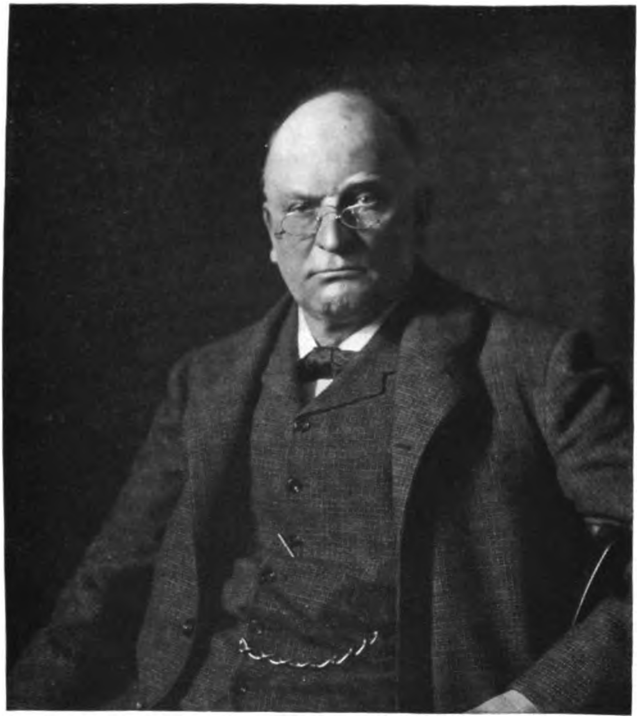
Authorities differ as to the proper strength of the sensitizing solution, and also whether it should be acid, neutral, or alkaline in condition. The general opinion is that a bath containing 50 to 60 grains of silver nitrate to each ounce of water is the best, and that the neutral bath will prove the least troublesome. If distilled water is available it is wise to use it in making up the silver bath, but if time is given for the precipitate which forms to settle, any tap water may be used which does not obviously contain a large percentage of organic matter or other impurities. For the preparation of the silver bath Newcomb advises the following as a formula which has given him excellent results, and little or no trouble when a ream of paper per day has often been sensitized. Distilled water, 1 ounce; nitrate of silver 48 grains; nitrate of ammonium, 12 grains. The bath, of course, is made to up any desirable quantity, these proportions being preserved. When the solution is made up, add 2 drops strongest ammonia to each quart (or 32 ounces) of solution. This bath, or any other sensitizing bath, should be tested with a hydrometer when made and the test degree (given on the hydrometer tube) marked on a label on the bottle containing the bath, so that it may always be kept up to a uniform strength. For strengthening the bath as it grows weaker by use, 2 ounces of silver nitrate and ½ ounce of ammonium nitrate should be dissolved in a bottle containing 1 ounce of distilled water. After sensitizing say ten full sheets of paper, a few dashes of this strong silver solution should be added to the regular bath. If a quill be inserted in the cork this may be conveniently done. When not in use the bath should be kept in the sunlight, or at least for a few hours after use, and the bottle containing it should be well corked to avoid evaporation.

Taking Care of a Bath. All silver baths deteriorate with use in various ways. Thus, each sheet sensitized takes up a certain amount of solution, and this needs renewal. More than this, the remaining solution is weakened and needs strengthening. A certain proportion of albumen is also dissolved when the paper is sensitized, and other organic impurities contaminate the silver bath. Directions for strengthening the bath have already been given. Additions to the bath can be made from time to time from a second solution of the strength of the original bath, and the whole should be tested with the hydrometer to insure uniform strength. For the ordinary needs of the amateur worker, a bath of reasonable size should last quite a year without becoming choked with albumen or foreign matters. Plenty of "sunning" when not in use, and the addition of a little alcohol once in a great while to clear the albumen from the bath, will be all that is required with ordinary care excepting, of course, the refreshing of the bath with silver from time to time. Burton, in dealing with the tendency of the silver bath to become contaminated with impurities, or to turn acid, advises the occasional addition of an appreciable amount of a solution of carbonate of soda to the bath, shaking the bath after this addition and then permitting it to settle where it will receive plenty of sunlight. This carbonate of soda produces a precipitate of carbonate of silver, which is an insoluble and harmless precipitate so long as the bath is neutral, but which is used up in neutralizing any acid which may form by gradual use.

Argentometer. Lest the reader be unfamiliar with the use and meaning of the hydrometer mentioned, I may explain that this is a little instrument used for roughly estimating the strength of solutions containing chemical salts. The form of hydrometer used for silver solutions is often called an argentometer, and may be obtained from any dealer at a trifling cost. The ordinary variety consists of a glass tube or stalk with a bulb near one end, the stalk being marked off with graduated numbers or degrees. This tube is contained in a tall glass jar or holder, about ten inches in height and 1¼ inches in diameter. To use the argentometer, fill the container with the solution to be tested, and let the tube float upright in the liquid. It will be seen that the liquid reaches to a certain degree marked on the stalk or tube, which denotes the strength of the solution, or the number of grains of silver contained in each ounce of solution. The reliability of the argentometers sold for photographic use varies, and has often been questioned, but they will generally answer for all practical purposes.

Variations of the Bath. Having mastered the preparation and care of the silver bath, it is important to know that by varying its strength in silver we may adapt the paper to the character of the negatives in hand. It is often easier to change the bath than to change the character of the negatives to be printed from. For very intense negatives one can let the bath run down to as low as 35 hydrometer (though lower than that is not advisable, too weak a sensitizer producing a mottled effect on the print called the "measles") safely, and float what paper is needed for these "rocky" negatives on that. On the other hand, one may run it up as high as 80 hydrometer for weak negatives. It will be seen that the power is in the worker's hands to perfectly adapt his paper to his negatives, and if one kind of negative is always made and the bath does not quite suit it the remedy is apparent. We can develop plates to correspond with the exposure, but in no paper except that prepared by ourselves may we have paper sensitized to suit the requirements of different grades of negatives.

Sensitizing the Paper. On a table not more than waist high lay the tray — which must first be wiped out with a damp tuft of cotton — and carefully decant the sensitizing solution into the tray until the bottom is covered at least to the depth of an inch; for large sheets two or three inches is better, as it will of course become weak very rapidly if many sheets are sensitized on a scant bath. Now, if there be windows in the room darken it by drawing the shades, leaving ample light to work by but making sure that no strong light falls on the corner where the paper is hung to dry. In the drying corner there should be a table with some clean blotters,



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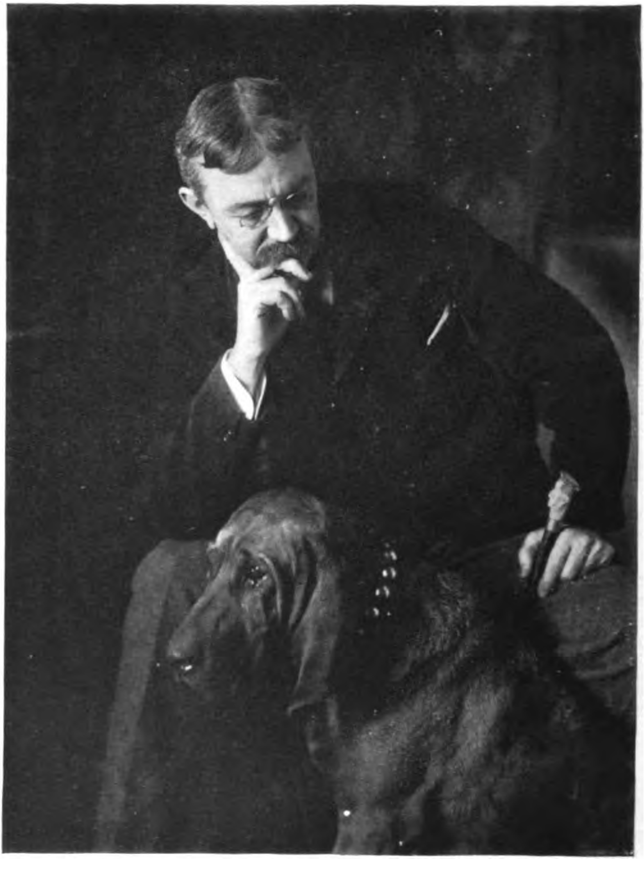


PORTRAIT OF MR. H. R. POORE, WITH HOUND

Arthur Hewitt

Pittsburgh Salon, 1900. R. P. S. Exhibition, 1900 wooden strips and photo clips, while over the table strings should be stretched in parallel lines to hang the paper to dry from. No dust should be flying in the room during the sensitizing of the paper, as if it floats on the surface of the bath it will result in speckled paper.

There are two methods of floating or sensitizing; the writer practices the first mentioned, since it is very economical and satisfactory. The second method is, however, that generally used. After bending over all four corners, seize the sheet by diagonally opposite corners between thumb and forefinger, and lower the left hand until that corner rests on the surface of the bath. Now gradually lower the right hand until the entire sheet has thus been *rolled* onto the surface of the bath. This method of laying down expels bubbles almost perfectly; still, as soon as the paper is a trifle limp it should be raised at each opposite corner and rolled back again to make sure that there are no bubbles, touching any obstinate ones with a toothpick to break them. Any bubbles remaining on the sheet will prevent its being sensitized on all such areas as they cover. As stated, this method almost entirely prevents bubbles, but it is safe to raise the other two diagonal corners as far as the center to make sure and either touch any that may appear or else blow them away. It is not a difficult matter to float a sheet after a little practice with stiff paper and water to prevent wasting either albumen paper or silver solution. When one has acquired the "knack," he need never get a drop of solution on either hands, clothes or floor, and it should be practiced until this can be done, always handling the sheet by the turned-up corners. In cold weather the sheets often curl at the edges, but this can be arrested at once by bending over and breathing on the curling edges. The paper should be kept flat if possible and in a room of ordinary temperature. If it is rolled be sure and have it rolled *coated side out;* specify this in ordering, as the dealer may roll it to save space and may not be very particular which way he rolls it unless specifically instructed.

Time Required.

On a bath of the strength given and in a room whose temperature is about 68–70° Fahr., two minutes is about the right time to sensitize; if cooler than that and the bath is not temperate, three minutes will be better. When sensitized the sheet floats flat and limp. Now grasp the two turned-up corners furthest from you and gently raise the paper, slowly and at an angle of 90 degrees from the surface of the bath. When properly raised out of the bath very little of the silver solution drips from the lower edge of the sheet, so little that it is hardly worth blotting. However, it is well to blot it; so, after allowing it to drain for a moment, lay it face down on a clean blotter, place another blotter on top, and by gentle pressure take up the superfluous solution. Then attach a wooden strip to the top and bottom of the sheet by means of four photo clips and hang it up to dry. When perfectly dry, so that it rustles when shaken, it is ready for fuming.

The other method of floating is to attach two glass rods to one end of the tray half an inch apart, and after sensitizing the paper drag it out over one rod and under the other. Some, again, only use one rod and merely drag the sheet slowly across that. Neither method is so saving of the precious fluid or so absolutely cleanly as that first given.

If any scum be noticed on the bath before sensitizing, it may be taken up by floating a plain sheet of paper on the bath, being careful to dry this sheet with the rest and throw into the waste bag.

Fuming. As soon as the sensitive paper is dry it is ready for use, but in this country it is found that if the dry paper is submitted to the fumes of ammonia for a few minutes it will not only print more quickly, but will give richer prints with less difficulty in the toning. This operation is known as "fuming" the paper, and is not practiced in England. We require a box of suitable size — about twenty inches wide, as deep as is necessary for the amount of paper sensitized and dried in half an hour, and about thirty inches high, for full sheets — fitted with strips of wood fastened to the sides of the box, about three inches from the top to support the strips clipped on to the paper when hung to dry. On the bottom of the box we place a saucer containing a little strongest ammonia. The sheets of dry paper are then hung or suspended by their wooden strips resting on the two side-supports. The door of the fuming box is closed, and the sheets of paper, hanging side by side and evenly separated, are subjected to the ammonia fumes for fifteen minutes.

In very humid weather, when the sensitized paper will not dry readily, it may be taken off the lines when just surface-dry, and the drying completed in the fuming box. To adapt the box for this occasional use, a hole must be cut in the bottom to admit heat from a lamp placed at some little distance beneath, and the door of the box should be left slightly ajar.

When the paper has been sufficiently fumed it should be removed from the box. If intended for immediate use place the sheets in a convenient drawer until needed. If tightly rolled, fumed paper will keep its qualities for a week in winter-time or cold, dry weather, but in summer-time it does not keep well, and should be used within twenty-four hours when the best results are desired.

Keeping Sensitized Paper. Sensitized paper may be "preserved" or kept fresh for varying periods of time by a number of methods. The length of time, however, depends upon so many conditions that it is at best uncertain. The weather and atmospheric conditions are the chief factors in the deterioration of prepared paper. In hot, damp weather paper will not keep more than a day or two at most without becoming discolored. It also deteriorates more quickly in towns than in country places, for obvious reasons. Paper sensitized on a clean, uncontaminated bath keeps longer than that floated on a bath more or less choked with organic matter. The old-fashioned way of keeping sensitized paper fresh and white for a few days was to store it in an air-tight box or tube rendered perfectly dry with calcium chloride. Care is needed that the calcium chloride does not come in contact with the paper. Such paper should be allowed to absorb a little moisture, or, better still, be re-fumed for a few minutes before printing, as otherwise it will yield poor prints. Two fairly efficient methods for preparing paper which will "keep" are as follows: *First method.* Make up an acid bath containing 1 ounce of citric acid to each 30 ounces of water, and float the paper on this for twenty minutes right after sensitizing and blotting. *Second method.* Soak clean, pure blotters in saturated solution of bicarbonate of soda and dry thoroughly. Keep the sensitized paper packed sheet by sheet between these soda blotters, under pressure. These soda blotters may be used repeatedly. Another method, given in the *British Journal of Photography*, is as follows: Sensitize the paper as usual, drain well, and wash by drawing the sheet through three changes of clean water. Now float the back of the sheet on a solution of nitrite of potash, 5 ounces; water, 100 ounces. When dry, roll the paper coated-side out, and wrap it in a sheet of blotting-paper previously soaked in the nitrite of potash solution and dried. Such paper needs to be fumed before printing, or it will print very slowly.

Cutting Paper to Size. When ready to print we require to cut our sensitized and fumed sheets to convenient sizes for our negatives and printing frames. For this purpose it is well to have carefully cut forms of plate glass of the proper size for *trimmed* paper of the sizes used. A stout board projecting out from the cutting table with a sheet of plate glass on top will materially aid in cutting up the paper. Fold the sheet into as many folds as will bring it to about the desired size, lay it on the cutting board and clamp it down with the proper sized form on top; now simply follow around the edges of the form with a shoemaker's knife kept sharp, and the trimmed paper is ready for use. By folding neatly and flattening well before cutting, a hand cutting machine can also be used to trim paper to size.

Printing. Albumen paper is printed just as aristotype paper is printed—a few shades deeper than is desired in the finished print. Albumen paper belongs to the class known as printing-out papers, i. e., it gives a visible image during its exposure under the negative, so that the progress of printing may be gauged to a nicety. As the printing proceeds, the print gives a reddish purple image, which gradually assumes a dark purple metallic luster in the shadows. A little experience will tell just how far to let a print go from the various classes of negatives we have to deal with. It should be noted that the print should not be examined in a strong light during printing or the whites of the picture will be tinted and degraded. This general tinting of a print by submitting it openly to light for a few minutes is often useful in softening the harsh contrasts given by a hard black and white negative. Usually, *this* tinting is done before the paper is placed in the printing frame.

Vignetting, washing, double printing and dodging for special effects are done in albumen printing just as in other printing methods, and need not be described here in detail.

Too much stress cannot be laid on the fact that printing in direct sunlight is *all wrong*, and no matter how much it hurries up the printing, it should not be resorted to except with very dense negatives, for which latter there is no excuse. One may print in direct sunlight, if there is no shady place, by covering each frame with ground glass or with two thicknesses or more of white tissue paper, but shade printing is less troublesome and should always be practiced. The amateur can always find shade enough to print a dozen frames; the professional will find nothing to equal a ground-glass covered shelf, or series of shelves, on the roof or out the windows. Such a shelf not only makes it possible to handle a very large number of frames, but also permits of printing during rain or snow. All who will take the pains to make a shade and a sun print from an average negative will see the great difference in results, and if they care for high-class work they will see that they *must* spare time for shade-printing.

Toning Preliminaries. After printing for an hour or two the reader will have a batch of prints ready for finishing, and will be anxious to proceed with the work. Since the prints as they come from the printing frame have a disagreeable foxy red or purple color, it is usual to change this color to a more agreeable tint of brown, purple-brown or brown-black. This is accomplished by depositing gold on the image in a very fine state of division. In other words, we coat the atoms of reduced silver forming the image with gold. This operation is known as "toning the print" and, although erroneous from the artist's point of view, we may accept the term. The toning of a print with gold not only gives it a more agreeable color, but also adds to the permanency of the image, since gold does not change by exposure to light and varying atmospheric conditions as silver does.

Under ordinary conditions the silver print, when immersed in a gold toning bath, changes first to a reddish color, gradually turning darker as gold is deposited until it assumes a dark, purplish brown and finally blue-black. The so-called tone obtainable on any print-out paper depends largely on the character of the negative from which the print was taken. Formulæ have been freely given for obtaining brown, purple, sepia and other tones, and with good average negatives they are productive of color effects approximating those claimed for their use, but inasmuch as the tone depth of the print depends on the quantity of reduced silver on which the toning agent has to work, and the reduction of silver depends on the character of the negative, we see that such formulæ can only be approximate and not absolute. A slow printing negative of fair opacity, or one made to print slowly by being shielded with several thicknesses of tissue, is most apt to prove responsive to our efforts to get certain desirable tones.

Successful toning depends also upon the condition of the toning bath and its composition. The water used in preparing the bath needs careful attention; distilled water or rain water being preferable to that drawn from the town supply or from rivers, the latter being peculiarly liable to contain injurious salts. It may be taken as a settled thing that the toning bath should never be acid, nor more than very slightly alkaline. Another point to be noted is that each full sheet of paper toned will exhaust one grain of gold, so that it is necessary to take care that the toning bath has sufficient gold to tone the number of prints in hand. Excess of alkali in the toning bath bleaches the finer details in the print, and should for this reason alone be avoided.

Let us now prepare a toning bath, and make ready our prints, after which we can again take up the commonly used toning methods.

Stock Gold Solution. As the toning methods to be described here are all based on the use of gold as the toning agent, we require, first of all, a stock solution of gold. Chloride of gold is invariably used for this purpose, and the CP (chemically pure) variety should be used in preference to the "gold chloride and sodium," because in the CP variety we know what we are working with, while the amount of pure gold in the double salt is a matter of uncertainty.

To make the stock solution, dissolve 15 grains of gold chloride, CP, in 7½ ounces of distilled or rain water, and we label the bottle "Stock Gold Solution." In this solution have 1 grain of gold to each half ounce of solution, and we know that 1 grain of gold will tone a full sheet of albumen paper. The *stock gold solution* should be kept on a dark shelf, where it will not be exposed to strong light. To make a toning bath for, let us suppose, 5 sheets of paper, or prints equivalent to five full sheets, take 2½ ounces of the *stock solution* and add bicarbonate of soda until red litmus paper, placed in the solution, turns blue, thus indicating that the solution is alkaline. Add this alkaline gold solution to two quarts of water, and the toning bath is ready — a simple bath, but one upon which we can rely for all reasonable needs.

Other Toning Baths. From among the hundreds of formulæ given for toning silver prints the following are offered as recommended by experienced workers and well proven.

Uranium-soda. Water, 16 ounces; acetate of soda, 30 grains; common salt, 30 grains; chloride of gold (neutral), 2 grains; uranium nitrate, 2 grains. Dissolve the salt and acetate of soda in half the amount of water given; next dissolve the uranium in 1 ounce of water and neutralize with a few drops of bicarbonate of soda solution. Add this to the first mixture and then add the gold, making the bath up to 16 ounces. This was a favorite bath when albumen paper was at its greatest popularity. It should be prepared a few hours before use, and where warm, brown tones are desired, the uranium may be omitted.

The acetate-gold bath is one of the simplest and most efficient. Dissolve 60 grains of acetate of soda in 15 ounces of water, add 1 ounce of the stock gold solution and the bath is ready. Sometimes an acetate bath works very slowly at first. In this event add two or three grains of bicarbonate of soda, which acts as a starter. This acetate bath was used by Adam Salomon, whose silver prints were universally admired for their richness and depth of tone.

Another excellent bath is the *phosphate* bath, made by dissolving 40 grains of phosphate of soda in 15 ounces of water, and adding 1 ounce of stock gold solution. This bath should be made up an hour before use, and cannot be used a second time. It gives purple tones, inclining to purple-black if toning is well carried through.

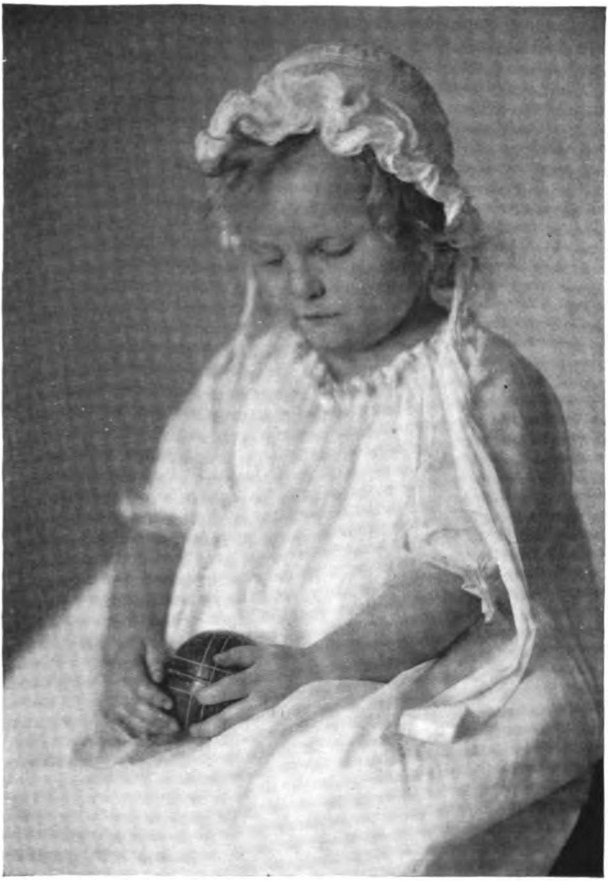
A *borax* bath is recommended by many of the older workers. Dissolve 120 grains of borax in 15 ounces of water, and add 1 ounce of the stock gold solution. This, like the phosphate bath, does not "keep" well, so that it should be freshly made for use each time. It is ready for use as soon as prepared.

Finally, the *tungstate* bath may be mentioned as one very generally used. Dissolve 45 grains of tungstate of soda in 15 ounces of boiling water. Let cool, and add 1 ounce of the stock gold solution. This gives chocolate-brown and brown-black tones, and may be used repeatedly if new gold solution is added from time to time to replace that used in each toning.

Washing Before Toning. Having made the toning bath ready, our prints need attention. Before they can be toned they must be thoroughly washed, so that the free silver present may all be removed. This is done by immersing the prints, one by one, face down, in a deep tray of water. When all the prints have been thus immersed the water is seen to be milky, which is caused by the free silver in the solution. This first wash water should be carefully poured off when the prints have been transferred, one by one, to another bath. In this way the prints should be turned over and transferred, singly, from one bath to another, until they have had five changes of water. The first and second wash waters should be poured off into a waste barrel and saved, as they contain a large portion of silver, which can later be recovered. With each succeeding change the wash water grows less milky in appearance, and when it remains clear we may safely assume that all free silver has been removed from the print. This is important, for if any free silver is left in the print it will not tone except at the surface, and in the "fixing" the hypo will dissolve our tones away completely. It is also important, if we would avoid blisters, to see that the temperature of the wash water is uniform; if it is not lower than 65°F. nor higher than 70° we need not fear any trouble.

Toning. From the last washing the prints are immersed one after the other in the toning bath already mentioned. Too many prints should not be immersed at one time, and all the prints should be kept quietly moving while in the toning bath. If we could watch an old printer at this stage we would see him put each print face down into the toning solution until he had perhaps as many as eight prints to watch. With an occasional quiet rock given to the tray, and a quick glance through the prints held between himself and the light, he would keep track of the progress of toning with deftness, feeding untoned prints into the tray as fast as he removed fully toned prints from it. The proper moment when to remove a print from the toning bath is one of those few things in photography which one must learn for oneself. It depends on the character of the print and the effect desired in it when finished. The chief difficulties to avoid are over-much and over-little toning. This even the beginner can avoid if he will learn from the start to judge the print by its color when looked through between himself and the light by which he works. If the original reddish tinge of the print before toning is still generally prevalent when he looks through the image, then he may safely give it a little longer in the toning bath. If, on the other hand, the lights and half-tones show a bluish gray tint, we may be sure that toning has gone too far. Perhaps the best general rule is to tone until there is just a trace of warm color in the shadows.

Fixing. As the prints are toned they should be immersed in a tray containing clear water to which a little salt has been added. Here they may remain until all are toned, when they are given a slight washing in a change of water, and immersed in the fixing bath made by dissolving 1 ounce of hyposulphite of soda in 8 ounces of water. In the fixing bath, as in the toning bath, the prints should be kept moving, and not permitted to lie on one another. The best way to accomplish this is to gently rock the tray with one hand and occasionally turn the prints over and over with the other. Fixing will be complete in fifteen minutes. It is important that the fixing should be thorough, as upon this and the after-washing depends the permanency of the prints. Two other points must also be mentioned. The temperature of the fixing bath must be the same as that of the toning bath, or blisters and other evils will crop out and ruin all the work.



Arthur Hewitt

Henry H. Pierce

After fixation, the hypo solution should be poured off into the waste-barrel, and the prints well washed in constant changes of water for an hour at least. Small prints are most advantageously washed in a siphon bath which keeps them constantly in motion, in a changing current of water. Large prints should be laid on a sheet of plate-glass and washed with a hose in the hand, giving each side ten minutes' washing.

Hypo Test. Inasmuch as the permanency of the prints depends upon the complete elimination of the hypo from the film, it may be useful to know how to test a print to find out whether it is thoroughly washed or not. The following solution should be made up and kept ready for use. Permanganate of potash, 2 grains; carbonate of potash, 20 grains; water 40 ounces. To make the test add a few drops of this solution to a quantity, say 20 ounces, of the last washing water, and if any hyposulphite is present the pink tint of the solution will change to a greenish yellow. In such an event the prints in question should be given further washing.

When washed the prints should be "blotted off" by pressing between sheets of absorbent paper, and either mounted while damp or left under very slight pressure to dry. The simplest way to mount many albumen prints of the same size is to pile them evenly over each other, keeping them face down; put the pile on a sheet of thick glass, press out any moisture remaining with a sheet of blotting paper, spread the paste over the top print in a thin even layer, lift carefully with the point of a knife and place in position on the mount.

Saving the Wastes. A final word may be said on the disposal of the wastes in albumen printing, which applies equally in plain paper printing. It will probably surprise the reader to hear that less than 5 per cent of the silver used to make a print is present in the finished picture, while the proportion of gold in the print does not exceed 25 per cent. From this it is plain that those who propose to do considerable silver printing will do well to devise a plan to save the "wastes," from which as much as 85 per cent of the silver used may eventually be recovered by the refiner.

Trimmings, spoiled prints, sheets used to clean the surface of the bath, tufts of cotton used to wipe out the tray and everything used with silver on it should be kept in a tight box or dark bag, the box being better. All wash and hypo solutions should go into the waste barrel, which may be conveniently made by inserting a wooden spigot a foot from the bottom of any tight barrel with its head knocked out. When the barrel becomes full, throw in saturated solution of sulphite of potash until a precipitate no longer forms, and then drain off the water. When the muddy precipitate is nearly up even with the spigot it should be removed and dried in the sun, and when a goodly quantity of this and of clippings, etc., is ready it should be sent to the refiner.

Gold toning baths should be thrown into a carboy and the cork left out so that they may evaporate freely. When full, precipitate the gold with a strong solution of protosulphate of iron acidified till it turns blue litmus red with sulphuric acid. After the precipitate is all down the clear fluid may be drawn off. Be sure that the iron solution is acid, however; otherwise the gold will be lost.

Plain Paper Printing. Doubtless many readers have waded through the preceding pages, simply gathering a hint here and there as general information, but really interested in the other half of the subject—plain paper printing. This, with the knowledge we have of albumen printing, can now be intelligently considered.

Albumen paper is one thing; plain silver paper is another, and quite different, full of possibilities and offering the largest freedom in surface, texture, choice of support and in the color of the print. It is also undoubtedly simpler than albumen printing, and can more easily be adapted to special needs. A plain paper print is something which the worker has to make for himself, from the raw paper support to the finished picture. If it does not please him the fault is his alone, and he can modify his manipulation in a hundred ways to gain a special effect or suit his purpose or please his fancy. The equipment needed for albumen printing is all we need for the manipulation of plain paper, except that we will require a Blanchard brush for coating. This we will make for ourselves when we come to its use.

Papers. First, we must select the paper on which the print is to be made. We have choice here among all the papers made, provided only that they are pure, that is, made of rags only, and free from wood pulp, chemical salts or other deleterious matter. It must also be free from metallic particles. The plain photographic papers are all good, *Rives*, *Saxe*, etc. Any good linen ledger paper, and almost all bond papers or drawing papers are as desirable as the expensive special papers. Whatman's, Arnold's, Japanese Vellum, Crane's Parchment No. 44, or No. 56, or Crane's Glazed Bond No. 43, or No. 36; all these are good, the smooth papers for small work or pictures where detail is desirable; the rough drawing papers for large work and broad effects.

Preliminaries. The first steps in plain paper printing are to "size" and "salt" the paper. Sometimes these operations are combined, at other times they are done separately. The object of the "sizing" is to prevent the salting and sensitizing solutions from sinking into the paper, which would mean flat, gray prints. The sizing also influences the color and nature of the silver image, and plays an important part in the reduction of the silver salt. The salting is essential to produce the sensitive salt chloride of silver, when the paper is coated or brushed over with silver nitrate, the sensitive film required being a thin film of chloride of silver, with nitrate of silver in excess.

Sizing and Salting. Some of the papers mentioned, especially the bond, vellum and *Rives* are already sized, but generally speaking, all papers will be the better for a special sizing. In the case of the rough drawing papers it will be well to use a heavier size, or to size the paper twice. The sizes most generally used are arrow-root and gelatine. Agar-agar, (a seaweed), starch, and resin-soap are also used as suitable "sizes" for certain papers. With all papers, by the way, there is a right and a wrong side. This can be told and the right side distinguished by holding the sheet up to the light until you see the water mark or maker's name and read it in the usual way. The side which is then next to the eye is the right side to size, salt and sensitize, and a mark on the wrong side will enable us to distinguish each at any time. A plain size is a two per cent solution of Nelson's No. 1 gelatine, or a one per cent solution of agar-agar. Fairman advises: To size the paper take for each ounce of solution needed 12 grains of Nelson's No. 1 gelatine; soak until thoroughly dissolved, using gentle heat to facilitate the combining of the gelatine with the water. This solution is used warm and the sizing is accomplished by drawing the sheets of paper through the tray containing the solution or by immersing the sheets in the solution. Ordinarily from two to three minutes is ample time to allow for sizing each sheet; the sheets are then hung up by clips to dry in a room free from dust and where they will not touch each other.

When the paper is separately sized as above it needs salting. This is accomplished by immersing the paper in a tray containing a bath prepared as follows: Ammonium chloride, 130 grains; sodium carbonate, 3 grains; water, 16 ounces. The paper should remain in this bath about 3 minutes, after which it is carefully drained and dried in a room free from all dust.

It is generally preferable, however, to combine the sizing and salting operations, as saving one operation. Moss gives several methods of preparing different papers, and the next following pages are taken from his complete account of *Home-Salted Papers*, published in 1897.

Arrowroot Paper. Of all the starches used for sizing, the best is arrowroot. This is equally adapted for gold or platinum toning, and one of the best formulæ is that given by Lyonel Clark:

Ammonium chloride, 120 grains; carbonate of soda (recrystallized), 200 grains; citric acid crystals, 60 grains; arrowroot, 180 grains; water, 20 ounces.

To prepare this, rub the arrowroot into a cream with a little of the water, taking care to rub out any lumps; then heat 15 ounces of the water to the boiling point, and pour the arrowroot cream very slowly, with constant stirring, into the middle of the boiling water. The mixture should be quite translucent and free from any lumps, which are only formed if the arrowroot is poured in too quickly. In any case it is just as well to boil it up for about five minutes and then remove from the fire. Now add the salts to the remainder of the water in a fairly large measure; the acid and soda will effervesce, and it should be well stirred till all the crystals are dissolved and effervescence has ceased. The resulting solution should, it is said, be alkaline, but a slight acidity really does not matter. This solution should now be added to the arrowroot, and the whole filtered through two thicknesses of nainsook whilst still hot, and it is then ready for use.

By increasing the quantity of arrowroot in the above formulæ to 270 grains a much thicker solution is obtained, which keeps still more on the surface of the paper, and thus gives more brilliant prints.

Gelatine Paper. As with arrowroot, the gelatine may be used either as a preliminary sizing or it may be combined with the salting solution, and a favorite formula is Hardwich's:

Ammonium chloride, 96 grains; sodium citrate, 96 grains; gelatine, 10 grains; water, 10 ounces.

Agar-Agar Paper. There is no doubt that this paper is by far the best so far, as it gives very fine matt prints, and yet the image is kept well on the surface. This, no doubt, is partly due to the method of preparation, for, as the starch and gelatine solutions are used in the liquid state, it is preferable to use the agar-agar in the form of a jelly, as it is difficult to keep it liquid except by heating, and, if applied warm to the paper, it immediately sets in a skin, which destroys to a great extent the matt appearance, besides having a tendency to scale off.

To prepare the salting solution allow 45 grains of agar-agar to swell for half an hour, or an hour, in 10 ounces of cold water, and then boil for ten minutes, and 90 grains of sodium chloride should be added and the solution kept warm for at least half an hour. This may be effected either by placing in a saucepan of hot water, or, what is preferable, wrapping the measure in thick flannel. At the end of the time the clear supernatant liquid should be decanted from the slight sediment; in fact, it is preferable to only pour off 8 ounces of the solution and throw the other away. The solution should then be poured out into a clean flat dish and allowed to set. When set, it should be cut up into rather small pieces and placed in the center of a sheet of well-washed and damp nainsook, and, the ends being gathered up, they should be twisted round and round and the jelly squeezed out through the pores of the nainsook into a dish.

To salt the paper, about half an ounce of this jelly should be placed in the middle of a sheet of paper 22½ by 17, and spread all over as evenly as possible by means of a Blanchard brush, and then evened out by means of a soft varnish mop brush used with a circular motion.

Arrowroot and Gelatine Paper.

Nicol recommends a combined gelatine and arrowroot formula for sizing and salting. I quote: The following formula will be found convenient where whole sheets are to be floated the most economical and convenient way: Ammonium chloride, 500 grains; sodium carbonate, 537 grains; citric acid, 420 grains; arrowroot, 250 grains, gelatine, 250 grains; water, 50 ounces.

Soak the gelatine for an hour or two in 10 ounces of the water, and beat up the arrowroot to a smooth cream in as much water as may be necessary. Dissolve the soda in another 10 ounces, and add the acid gradually. When effervescence has ceased, mix all three together, and in a porcelain-lined vessel heat until the arrowroot is transparent, just short of the boiling point, with constant stirring. Remove from the fire, add the remaining 30 ounces of water, and filter.

The only objection to the gelatine is that the solution must be used while it is still warm, and those who object to that may substitute for it another 250 grains of arrowroot. The soda and acid also may be omitted, but the citrate of soda which they form has a decidedly beneficial influence on the color and brilliancy of the resulting print.

Gum Arabic Paper.

Fairman sends a formula wherein gum arabic takes the place of gelatine as follows: Ammonium chloride 100 grains; starch 30 grains; gum arabic 60 grains; water 10 ounces. The solution should be prepared by dissolving the gum arabic and starch in the water given, and then heating the solution until it commences to boil. Then add the ammonium chloride and filter into the tray in which the paper is to be salted.

Resin Paper.

The use of resin as a means of preparing salted papers for plain silver printing has not been heard of during late years. It gives an excellent paper and is not difficult to prepare. By toning it with *warm* solutions of platinum, very rich warm black tones are secured, not readily obtainable with other papers.

The plain resin paper is prepared by using a mixture of shellac and arrowroot. The shellac solution is made by powdering some white shellac, and boiling with ammonia and water. A 10 per cent. solution will be required, and therefore the formula will run: Ammonia, 24 minims; distilled water, 1 ounce; white shellac, in powder, 48 grains.

The shellac should be mixed with the water, and the ammonia added, and the solution heated till the resin is all dissolved. This solution, which is, of course, very similar to the water varnishes for pastel and charcoal drawings, will keep any length of time.

To prepare the salting solution dissolve 12 grains of arrowroot and 12 grains sodium chloride in an ounce of water in the manner previously described, and add to it, with constant stirring or shaking, 48 minims of the shellac solution, for ordinary smooth-surface papers; for drawing and other rough-surface papers the quantity of shellac solution should be doubled.

A Resin Emulsion Paper.

The resin emulsion paper is best prepared according to Valenta's formula, in which the resin solution or soap is mixed with salted gelatine and precipitated by the addition of an acid, such as citric acid.

Valenta's method is as follows: Dissolve ammonium chloride, 48 grains, in distilled water, 1 ounce; and add: gelatine, 20 grains.

Allow to soak for two hours, and then melt by the aid of a gentle heat.

The resin soap is made by dissolving light French resin, 20 grains; in distilled water, ½ ounce; ammonia, 20 minims.

The ammonia and water should be heated and the resin, which must be finely powdered, added in small quantities with constant stirring, adding, if necessary, more ammonia till complete solution of the resin is effected. The resin should not be bought in powder as the ordinary commercial powdered resin is, as a rule, of the poorest quality and dark colored; and the clear, light yellow French resin should be used.

The resin solution is added to the gelatine solution with constant shaking, and then the total bulk made up to 2 ounces. To this must be added very carefully, and drop by drop, hydrochloric acid, the whole being constantly stirred till it is quite neutral to litmus paper. Finally a saturated solution of citric acid should be made and added in small proportions at a time to the warm gelatine and resin solution, with constant stirring till it turns quite milky and has a strong acid reaction.

This solution soon sets to a jelly, but must be used warm, and although Valenta recommends it to be applied in small quantities to the paper so as just to damp the surface and then to float the paper, I have obtained equally good results by using a Blanchard brush and distributor without any floating. It is applicable not only to smooth, but to rough-surface papers, but there is some little difficulty in obtaining a perfectly even coating with the latter.

The Sensitizing Solutions. Although the papers, described above, may be sensitized by floating on a silver solution as mentioned in albumen printing, it is decidedly a costly process, for it means keeping a fairly large amount of silver solution in stock, whereas if the silver solution is applied with a brush, practically no more than is actually required need be used.

Whilst the same sensitizing bath may really be used for all the papers, it is preferable to suit the sensitizing to the salting solutions, and therefore, for reasons which I need not enter into, the following are specially recommended.

For arrowroot paper: Silver nitrate, 140 grains; citric acid, 55 grains; distilled water, 2 ounces.

For gelatine and agar-agar paper: Silver nitrate, 140 grains; citric acid, 100 grains; distilled water, 2 ounces.

For plain resin paper: Silver nitrate, 120 grains; citric acid, 80 grains; distilled water, 2 ounces.

For Valenta's paper: Silver nitrate, 120 grains; distilled water, 2 ounces.

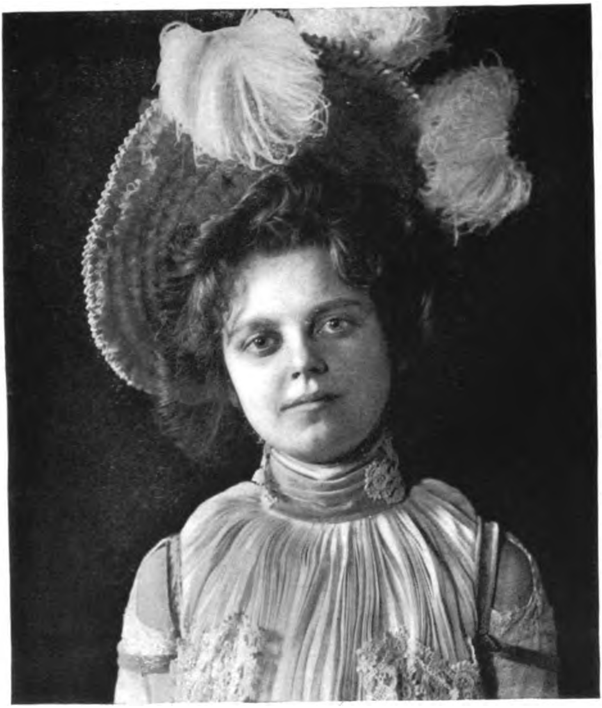
Reckoning out the amount of chlorides present in the papers, we shall find that it will require about 10 grains of silver nitrate to properly sensitize them, to every square foot of surface, and, therefore this corresponds to about 70 minims of the 140 grain, and 80 of the 120 grain baths, so that, in sensitizing any sheet of paper, it is merely necessary to reckon up its area to find how much silver solution is required for the whole sheet.

Sensitizing the Paper. The actual process of sensitizing is very simple. The sheet of paper is laid flat on a clean table or drawing-board, and can, if necessary, be pinned down, preferably by aluminum drawing-pins, or else held at the sides by wooden American clips. The required quantity of silver solution is poured into the middle of the paper, and rapidly distributed by means of a Blanchard brush, the strokes being first in the direction of the length, and then in the transverse direction, and finally, light circular motion of the brush to even it out.

I have frequently mentioned a Blanchard brush, and for the benefit of those who do not know these handy little instruments I will describe how to make one. Procure a piece of stout celluloid, about half-plate size (a discarded 5 x 7 celluloid film will do), and bend it in the direction of its length, not sharply, but just so as to bring the edges together. Procure also two little strips of wood, 6½ inches long, ½ inch wide, and ¼ inch thick, two wooden clips, or strong metal paper clips will do, but I prefer to use wood ones, as there is no danger of contamination of any solutions. Some white swansdown calico, which runs about ¾ of a yard wide, and costs about 30 cents per yard, should also be obtained. Pieces should be cut off this slightly wider than the celluloid, and about the same length; thus if I use one-half plate celluloid, I cut mine 6¾ x 5⅛ inches; this is laid, fluffy side down, on a piece of paper — the swansdown must be thoroughly soaked in water, and then wrung out as dry as possible — the celluloid on the top, and the two bent round, the two pieces of wood laid along the two edges, and clipped together with the clips. The advantage of this is that, after use, the swansdown may be thrown into the residue tub, and a new piece used for next time.

Printing. The printing of home-salted papers offers no particular difficulty; the only point is that care must be taken to obtain absolute contact with the negative.

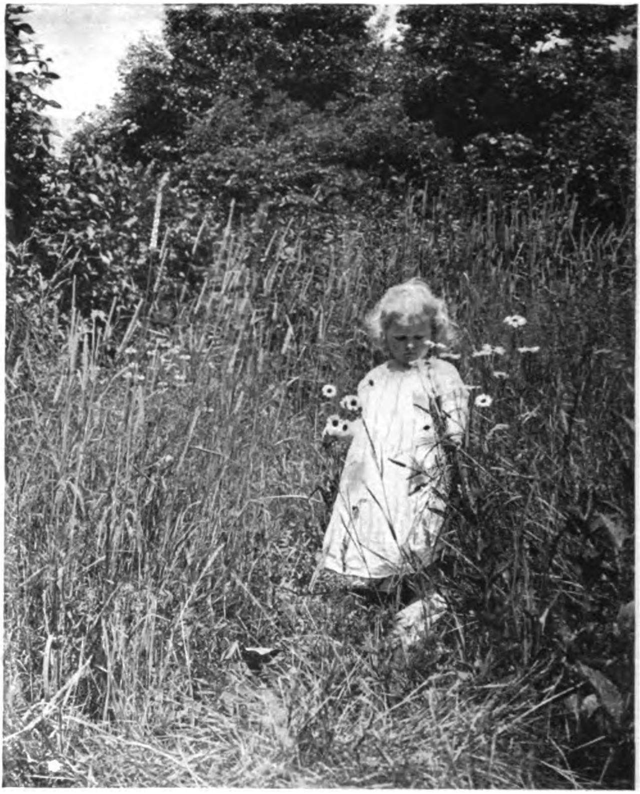
In the case of weak, thin negatives, it may be useful to fume the paper, and for this purpose there is nothing better than an old plate-box, on the bottom of which should



AN AMERICAN GIRL

Arthur Hewitt

R. P. S. Exhibition, 1900



A FRIEND OF THE DAISIES

Arthur Hewitt

R. P. S. Exhibition, 1900

be placed a sheet of blotting paper, on which should be sprinkled about ten minims of strong liquor ammonia. The fuming box described for albumen printing will be more useful, of course, where a quantity of paper is being fumed at one time. The sensitive paper should be pinned to the lid, inside of course, and the box closed and left for about ten minutes. Fumed paper will not keep more than a day, and therefore not more than is actually required should be fumed.

All these papers require printing a little deeper than is usual with printing-out papers such as *Solio*.

Preliminary Washing. After printing, the prints must be well washed and it is preferable to place them in a 10 per cent solution of common salt in order to convert the whole of the free silver nitrate into chloride, and thus prevent any staining of the whites. The only action of the salt in the toning bath is to slow its action, and therefore the paper need not be thoroughly washed, but it is advisable to at least free it from excess of salt by two or three changes of water, or five minutes' washing in running water.

Gold Toning. Any gold bath used for albumenized paper may be used for plain paper if diluted to half the usual strength, and in consequence of the absence of any, or at least the minimum of vehicle, they tone very quickly, and the tones wil- range from a reddish-brown to purple or slaty-blue according to the length of time the prints are left in the bath.

Platinum Toning. The best tones, or at least very pleasing tones, ranging through the sepias to brown and blackish-brown, may be obtained by the use of platinum. The class of tones given by platinum are at the present time very fashionable, and for success in platinum toning there are certain requirements which must be fulfilled.

In the first place the prints must be absolutely devoid of any free or uncombined silver nitrate, and therefore for this purpose the preliminary salt bath must be used, and the prints rinsed afterwards as described above.

The platinum bath must be acid, and the print absolutely free from all platinum and all acid before fixing. To effect this latter end, after toning they should be well rinsed and then immersed in salt, 2 ounces; washing soda, ½ ounce; water, 20 ounces; and again washed.

One of the best and simplest platinum toning baths is—Potassium chloro-platinite, 1 grain; salt, 10 grains; citric acid, 30 grains; water, 8 ounces; or, in place of the citric acid, ½ ounce of dilute phosphoric acid may be used.

Nitric acid has a tendency to give yellowish whites, and should therefore be avoided.

There is not, unfortunately, any guide from the appearance of the image, either by reflected or transmitted light, as to the final tone, but, as a general guide, it may be considered that when the prints, which are at first yellowish, turn reddish, the final tone will be a brown, and, if the toning is allowed to go on till the image is a violet, the final tone will be a brownish black.

Combined Gold and Platinum Toning. Although the word "combined" is used here, it is not really a combined bath that is used, because the platinum will not tone in an alkaline bath, and the gold only slowly in an acid one; but if the prints are first treated with a gold bath, either the acetate or, better still, the chalk or soda bath, and then with the platinum, the so-called engraving black tones can easily be obtained.

The chalk bath is made by adding about 30 grains of fine powdered chalk to 1 grain of chloride of gold, and 2 ounces of hot water, shaking and making up to 10 ounces with cold water, allowing to settle, or filtering, and then using. The soda bath is made in precisely the same way, only using pure carbonate of soda instead of chalk, and, of course, no filtration is necessary.

After toning, the prints are washed, just as was described for albumen paper, when they are ready for fixing. Moss gives the following as a desirable fixing bath: Hyposulphite of soda, 2 ounces; salt, 1 ounce; washing soda, ¼ ounce; water, 1 pint. In this bath the prints should be kept on the move at least a quarter of an hour, and then well washed.

Ammonia-Nitrate Paper. A method much favored in this country is that known as the ammonia-nitrate method. I take Dr. Nicol's description, beginning, of course, with paper sized and salted according to his formula given on a previous page. This ammonia-nitrate paper is more sensitive than some of those already given, and tends to better colors in toning, but it should be applied with a brush rather than by floating, and the paper will not keep good beyond a few hours. The solution may be made as follows: Silver nitrate, 300 grains; water (distilled), 5 ounces; stronger ammonia (.880), q. s.

Dissolve 250 grains of the silver in 4 ounces of the water and add ammonia gradually until the precipitate first formed is dissolved, taking care not to add more than is necessary. Dissolve the remaining 50 grains of silver in the remaining ounce of water; mix the two solutions and filter.

The sensitizing solution is conveniently applied with a Blanchard brush, as before described. A pool of the solution (just how much will soon be learned by experience) is poured on the center of the sheet and spread with the brush, care being taken to make the coating as even as possible. After an even coating has been obtained, it is necessary to let the sheet lie a few minutes before hanging it up to dry, so that the solution may be sufficiently absorbed.

Platinum Toning. For toning this paper any albumen-gold toning bath, weakened as already suggested, may be used; or we can tone with platinum. The following will be found an excellent formula. The stock solution of platinum is conveniently made by dissolving a 15-grain bottle of potassium chloroplatinite in 15 drams of water, thus making it 1 grain to the dram. The acid solution is 1 dram of acid nitric to 7 drams of water. To make the toning bath take platinum solution, 4 drams; water, 8 ounces; acid solution, 20 minims.

By using Aristo-platinum solution and following the makers' directions as to its use for Aristo-platino prints, good engraving black tones may be produced on any arrowroot paper.

Toning is conducted exactly as in the case of gold, but the prints must be washed until every trace of free silver nitrate is removed. Tones from warm brown to deep velvety-black are easily got, but for the latter the printing must be deep and the action carried on until, on examination by transmitted light—by looking through—no trace of brown remains. When the desired shade has been got, the print is at once transferred to a solution of sodium carbonate, a pinch to the pint, to stop further action and prevent acid getting into the fixing bath, where it would decompose the hypo, setting sulphur and sulphurous acid free.

Toning With Copper. Instead of platinum, Ferguson's recently introduced method of toning with copper may be adopted, and will give colors ranging from dark brown to bright red. A good formula is the following. I quote Dr. Nicol: A. Copper sulphate, 1 part; potassium citrate (neutral), 10 parts; water, 100 parts. B. Potassium citrate (neutral), 10 parts; potassium ferricyanide, 1 part; water, 100 parts. Seven parts of A are to be mixed with six parts of B, and the print immersed in the solution until the desired shade is reached; and as the result of a series of experiments, I think better tones are got by toning with copper after fixing and, of course, proper washing.

Clemons' Plain Paper. It may be that the reader would prefer to buy his paper ready prepared rather than go to the trouble of choosing a suitable paper, sizing, salting, etc. As it happens, there is in the market a capital prepared paper which only needs sensitizing before use. This is *Clemons' Matt Surface Paper*, which I have used for some time with considerable satisfaction for all ordinary work. Clemons' instructions for the use of his paper are therefore included here for the convenience of the reader. It is an ammonia-nitrate paper similar to that described by Nicol.

The sheets are of the usual size. I generally cut them up as soon as received and store until needed for use. To sensitize, dissolve 480 grains (Troy) silver nitrate in 11 ounces of water. When dissolved, pour off 2 ounces, and to the 9 ounces left standing add strong aqua ammonia to form a precipitate, and redissolve the precipitate; then add the remaining 2 ounces, which will form another precipitate; to this add 9 drops of nitric acid, C P. Apply this to the paper smoothly and carefully with a tuft of cotton. See that the sheet is well cover from the light and air when dry. Print without fuming.

Aluminum Toning. Any good toning bath will give good results, but the best results are obtainable by using Clemons' aluminum toning bath, which is prepared as follows: *Stock Solution:* Chloride aluminum, 80 grains; bicarbonate soda, 360 grains; water, 48 ounces.

When mixed, this will form a flocky hydrate, which will settle to the bottom. It can be strained through clean washed muslin. To prepare a small bath for toning, take 12 ounces of the *Stock Solution* and add sufficient gold to tone in 8 to 10 minutes. The gold solution must be neutralized with bicarbonate soda before being added to the above bath. When the prints reach the desired tone throw them into a bath of salt water, made of water, ½ gallon; table salt, ½ ounce. This will arrest further toning and at the same time turn the free nitrate of silver that is left after the first washing into a chloride, and the hypo bath will clear or fix them very much quicker. By using the aluminum bath the prints change very little in tone in the fixing solution. For the fixing bath, take hypo, 2 ounces; water, 12 ounces. The prints will fix in about five minutes, with but slight change in tone. Wash thoroughly, as usual.

Fixing. A word or two of counsel from Dr. Nicol concerning the fixing of silver prints, and we can end our résumé with a clear idea of both albumen and plain paper printing. I quote: The fixing of prints seems to be less understood than its importance deserves. We are constantly hearing of the necessity for much washing, and much, if not all, of the fading into the sere and yellow is laid to insufficient washing, instead of to insufficient fixing, as it ought to be.

It is well known, although not so well as it should be, that the operation involves two chemical actions. The silver chloride or bromide, as the case may be, is first converted into silver hyposulphite, $Ag_2Na_4 3S_2O_3$, an insoluble compound which, if the paper or plate be removed at that stage, remains in the film and cannot be removed by any amount of washing. If, however, the fixing solution be strong enough, the silver hyposulphite is converted into a double salt of hyposulphite of silver and soda, $AgNaS_2O_3$, which is very soluble in water and easily washed away. Hyposulphite of silver, although in the film of the plate or paper invisible (that is, it remains when the whiteness has left the one and the other has become more translucent), will on exposure to light become yellow, giving to the print an appearance of fading and rendering the negative unprintable. The fixing solution, then, should always be of sufficient strength, 1 to 4 or 5 for negatives and 1 to 8 for prints; and the operation should be continued after the silver hyposulphite has been formed (that is, when the plate has become colorless) at least as long again as it took to form it. A plate that remained in the solution, say ten minutes before the creamy whiteness disappeared should be allowed to remain ten minutes longer. It is also well known, although not generally attended to, that acid hypo is prone to decomposition, and therefore should always be rendered alkaline by ammonia or other alkali, a lump of chalk left in the bottle being as good as anything where the hypo is kept in solution. And it should be considered a cardinal virtue to use the fixing solution only once—that is, for only one batch of prints. Hypo is cheap, and that is the only means of securing for the print a long life.

Acknowledgment. In making up this number of THE PHOTO-MINIATURE, I have had the able help of E. W. Newcomb and Charles E. Fairman, both experienced workers in the processes described. The papers of G. H. Moss and Dr. John

Nicol have also been largely drawn upon, and of their usefulness cordial acknowledgment is here made.

BOOKS.

Almost all books upon photographic printing processes devote a chapter to albumen and plain paper methods. The only books peculiarly devoted to these processes, however, are

The Art and Practice of Silver Printing (Albumen). By Captain Abney and H. P. Robinson. 136 pp. 1888. (English). Illustrated. $1.25.

Platinum Toning (Plain Paper). By Lyonel Clark. 96 pp. 1896. (English.) 50 cents.

Wilson's Mosaics, 1901, has a practical monograph on *Plain Paper Printing* by Dr. John Nicol. 50 cents.

Picture Making and Picture Taking. 1898. 50 cents. Also contains a clearly written chapter on *Plain Paper*, Its Preparation and Use, by Bernard Alfieri.

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NOTES.

If we could manage one of those inimitable editorial prose poems on the seasons for which the *Photo Era* was famous before it became so dreadfully scientific, we would be happy. Most surely the times are ripe for something of the sort, but the Fates are not propitious. We are living in strenuous fits and starts, and the old century is giving up its ghost in a veritable effulgence of photographic glory. How many delightful themes, if one had but the gift of the — Keiley for their interpretation! Lacking which we must keep to the sober facts.

◆

The exhibition of American photographs in London, an enterprise skilfully engineered by Mr. F. Holland Day as an advertisement of his entry upon the field of professional portraiture in that city, has aroused ire and other things of the sort in that photographically benighted but very self-satisfied community. Our exchanges are full of the "Exposition Hollandaise," and the end is not yet. It must be true, as the French say, that the English people take their pleasures sadly.

◆

On this side of the Atlantic the two photographic societies most closely connected with "the pictorial movement in American photography" have been thrashing things out with a vengeance. At a meeting of the Photographic Society of Philadelphia, held a week ago, a lively discussion took place concerning the policy and management of the recent *Salon*. The Salonists came out victorious, as their cause deserved. The Opposition was talked out of court, as it also deserved, for reasons which will appear later to those to whom they are not already apparent. The outcome of the affair is that every one interested has gained a clearer view of the real purpose of the *Salon*, and of the difficulties which attend an undertaking of its kind. At the same time, we learn with genuine pleasure that certain changes are to be inaugurated at the next *Salon*. The good work accomplished is to be conserved, but it will be animated by a new spirit and a larger tolerance.

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There has also been a storm in a tea-cup among the members of the Camera Club, of New York, concerning the management of *Camera Notes*, the official organ of the club, and other matters. Like unto that tuneful "organ," this affair was wholly made up of interesting personalities as seen under different microscopes. Those intimately concerned are, however, so abnormally sensitive to remarks other than their own that we refrain from all but the bare mention of the facts above stated. The affair was settled on the basis that "the time will come."

By the way, the idea that THE PHOTO-MINIATURE is "in a sort of cabal formed for the purpose of suppressing '*Camera Notes*'" is an absurdity. THE PHOTO-MINIATURE is "in" for all the joy there is in life, and would not wish *Camera Notes* suppressed under any circumstances. And also, by the way, the new number of *Camera Notes* just published contains, among other interesting items, a thirty-seven-page review of the Third Philadelphia Salon, by Mr. Joseph T. Keiley. This is the most creditable, as well as the most comprehensive, effort we have thus far had from Mr. Keiley's pen, and is of itself "worth more than a whole year's subscription."

❧

Photographic Mosaics, 1901. An Illustrated Record of Photographic Progress. 256 pp. 81 engravings. Price 50 cents. Edward L. Wilson, New York.

"Mosaics" must be included as one of the surprises of the year. It is so different this year, despite the familiar name; a delightful bit of bookmaking, and, in this detail, clearly surpassing the other annuals. Mr. Wilson has done wisely to bring his popular yearbook into line with the new century, and we predict for it a larger popularity than it has hitherto enjoyed.

The improvements do not, however, end with the mechanical part of the volume. The contributed papers are of a different sort and of a different character from the "scrappy" hints usually gathered for "annual" readers. And the illustrations are more numerous than in previous volumes. Taken collectively, these 81 illustrations form as fine a display of American professional portraiture as may be seen anywhere. This will materially add to the value of the volume as a book of reference. That there are examples which should have been omitted, goes without the saying, but the majority are worthy of their place.

The contributed papers are few in number, but of unusual length, being, in fact, monographs upon their

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subjects: *Printing on Home-Made Plain Paper*, by Dr. John Nicol; *Carbon Printing*, by Edw. W. Newcomb; *Platinotype Printing*, by Henry Troth; *Open-Air Portraiture*, by T. Perkins; *Studio Construction*, by W. E. Ward; *Indexing Negatives*, by Catharine Weed Ward, etc. The editor's résumé of the year's progress, under the caption *The Century's Last Year*, is well chosen for usefulness, and carefully compiled.

◆

The dearth of "familiar knowledge" concerning formalin and its characteristics, together with the growing importance of this agent in photographic practice, gives timely interest to a recent paper in the *Deutsche Photo Zeitung*. We extract from the translation given in *Photography* (December 6):

The active constituent of formalin is formaldehyde, a gas which dissolves readily in water, formalin being an aqueous solution containing 40 per cent of the gas. Since, however, the gas readily escapes from the solution into the air, it is important that bottles containing it should be well corked or stoppered. Formaldehyde, when dry, has comparatively little action on thoroughly dried gelatine or similar substances, and it is only in presence of a certain amount of moisture that its property of making gelatine, etc., insoluble comes into play. It is unnecessary to point out that the formaldehyde that escapes from formalin is necessarily in a moist condition, and that the tissues of the nose, eyes, mouth, and lungs, and the skin, always contain moisture. The effect of formaldehyde, and therefore of formalin and its vapor, upon human tissues is much the same as its effect on gelatine; it hardens them, makes them insoluble, or, in a word, kills them by making them unfit to perform their normal functions. The effect on the nose, eyes and lungs is most injurious, and may be productive of serious permanent disaster. The action on the skin is also very marked; the finger ends become very painful, the nails become hard and brittle, and the skin itself is killed, and has to be shed like any other dead matter. There is additional danger in the fact that these effects may not be recognized until they have become serious, and, consequently, all habitual users of formalin should be very careful (1) not to breathe its vapor or allow it to come in contact with the eyes, and (2) not to dip the fingers into solutions of formalin or allow it to be splashed on the back of the hand, but to use plate-lifters and take care to

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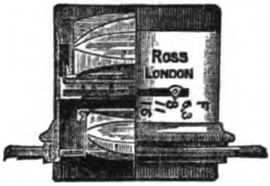

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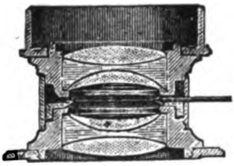

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rinse the hands rapidly if they come in contact with the formalin in any way.

◆

Mr. Walter Burke, of Christchurch, New Zealand, sends a copy of the Christmas number of the "Weekly Press." It is worthy of more than passing notice, and gives abundant evidence of the progressiveness of photography and newspaperdom in that far away corner of the British Empire. In form this issue of the "Press" resembles the Christmas numbers of the London "Graphic," and its fifty odd pages are illustrated with almost 200 half-tones from photographs displaying the cities, industries, scenery and life of the islands. Photographically and typographically the number is equal to anything we have seen done on this side of the water, and does honor to all concerned in its production. The cover and supplement are lithographed in colors, the execution of these being as notable in quality as the text and illustrations. Well done, New Zealand!

◆

Mariotypes is the name given to a new sort of prints introduced in England during the past few weeks. They are said to be produced "by the carbon process in the form of oval and circular miniatures; to be as permanent as enamels, but superior in point of finish, retaining all the detail of the negative. They are made in various tints, and hermetically sealed from the action of the atmosphere." (Marion & Co., Soho Square, London.)

◆

Voigtlander & Son, of Brunswick, announce a new catalogue giving detailed information concerning their *New Series Ia Portrait Lenses*, which work with the extremely large aperture of F/2.3. A new *Euryscope* Series VII a, with an aperture of F/18, is also announced. This is said to give a larger field of sharp definition on the plates for which it is listed than has previously been obtained. This enterprising house is now using the new metal *Magnalium* in the manufacture of its lens mounts, more especially for hand-camera objectives. Magnalium is somewhat lighter in weight than aluminum, but as hard as brass.

We hope that the American branch, Voigtlander & Son Optical Co., New York, will, ere long, let us hear more of these interesting introductions.

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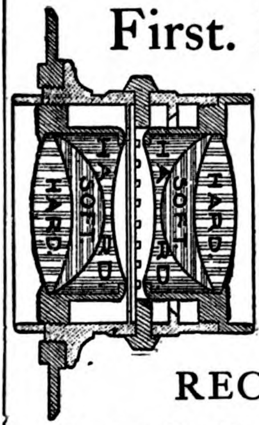

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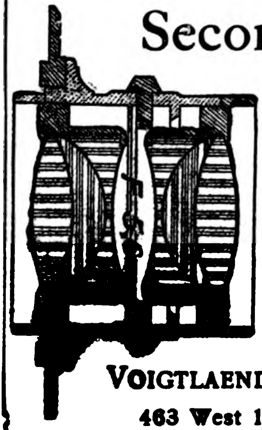

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Drs. Lange and Maltzing, of Munich, have made known the results of their recent attempts to photograph the membraneous lining of the stomach in a living person. Their apparatus consists of a miniature camera (sixty-six millimetres long and eleven millimeters thick), attached to the end of a stomach pump tube. A tiny electric lamp is connected to the camera to illuminate the interior of the stomach, and the films are exposed by means of an electric apparatus. The inventors of this unique camera claim that in ten minutes they can take as many as 40 or 50 photographs, and although the resulting negatives are necessarily small (viz., 11 by 8 millimeters), they are so "sharp" that on enlargement minute details are easily discerned. Whether this unique application of photography will be of practical advantage in the diagnosis of diseases of the stomach remains to be proved.

❧

"Photography" *Xmas Number* is another addition to the many attempts to "work up" the pictures of the year. It consists of 72 pages of coated paper enclosed within a heavy paper cover of tasteful design. Several illustrated papers on *The Photography of the Odd*, *The Work of Mr. Eickemeyer* (Eickemeyer is enjoying a "boom" just now), *Clouds*, and *The Peninsular Coast With a Camera*, share the text pages with reprints of illustrations given in the pages of *Photography* during the year. A number of original designs in black and white for Christmas cards fill out the number.

❧

Mrs. Käsebier, of New York, and Clarence H. White, of Newark, Ohio, were elected to the "Linked Ring" a few weeks ago. Mrs. Käsebier is the first woman honored in this way, and these two additions give America a representation of six "links" in the "ring."

❧

We note with interest the "absorption by the *Photo Era* (Boston) of *The American Journal of Photography* (Philadelphia), a photographic periodical of long standing and of unquestioned prestige in the photographic world"—vide *Announcement*. In other words, the proprietors of the *Photo Era* have purchased *The American Journal of Photography*, and incorporated it with the *Photo Era*. It is whispered that the price paid for the "absorption" was about $600, in which event the be-

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loved Thomas Harrison Cummings has invested fully $500 current funds in a halo of "unquestioned prestige."

Years and years ago there was an *American Journal of Photography* among the earliest of American photographic papers. In its day it "absorbed" a contemporary, and later was itself absorbed by the *Philadelphia Photographer*, if my memory serves me. In the early eighties Thos. H. McCollin & Co., of Philadelphia, issued a "house organ" under the old honored name, and under the able editorship of Dr. Julius Sachse and John Bartlett, in turn, the *A. J. of P.* acquired that "long standing" and "prestige" now in possession of the *Photo Era*. Surely *Puck* would have something to say of this if he were here. Be this how it may, we are glad that the name is to be revived and kept alive in such capable hands as those controlling the destinies of the *Photo Era*. Those who are curious to see the combination will do well to spend 15 cents for the Christmas number of the *Photo Era*, perhaps the best that has thus far been published.

◆

Mr. John Pringle writes from Chicago that he has been much pleased by the numerous visits of readers of this magazine to his desk in the western depot of the Lovell Dry Plate Manufacturing Company, 64 Wabash avenue. A dark-room has been equipped for the convenience of such visitors, and Mr. Pringle has "laid in" a new supply of interesting information concerning Lovell plates of every sort. Put the address in your pocket-book lest it be overlooked.

◆

A dainty pocket-book, enclosing calendars, spaces for addresses, and for daily notes during the year, with carefully selected information about business, computing interest on stocks and bonds, poisons, weather indications *and* Royle's Engravers' Tools and Machinery, comes to us from John Royle & Sons, of Paterson, N. J.

◆

The International Annual of Anthony's Photographic Bulletin, Vol. XIII, for 1901. Edited by W. I. Scandlin. 320 pp. Illustrated. Published by E. H. T. Anthony & Co., New York.

We have learned during the past few years to look for the *International* as an annual offering a great deal of

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enjoyment in addition to its store of useful information. This latest volume of the series fully meets our expectations. Mr. Scandlin has a happy faculty for finding writers who will give thoughtful articles. It is true that these demand more careful reading than the average contribution to photographic yearbooks, but they are much more satisfactory. Take, for example, Mr. Walmsley's long and interesting paper on *Edible and Poisonous Fungi, and How to Photograph Them.* Its completeness and the practical way in which it has been prepared are admirable. The numerous illustrations also add to its value to the student. To detail all the papers of interest would, however, severely tax our space. We therefore recommend our readers to obtain a copy of the book for themselves, and to devote a quiet evening to its perusal. It is well printed in legible type, profusely illustrated with examples of many different branches of photographic work, and is strongly bound in heavy paper. The section devoted to photo-mechanical work is, we think, better than in any previous volume.

◆

Those who have been bothered with impure or deteriorated carbonate and sulphite of soda (and who has not?) will be interested to know that the M. A. Seed Dry Plate Company has placed on the market special brands of these indispensable salts, which are guaranteed to be chemically pure. There should be a great demand for these as soon as the fact that they are ready becomes generally known. Doubtless they can be obtained from all dealers, but our supply came from Mr. George Murphy, 57 East Ninth street, New York, the Eastern Depot for Seed's plates and specialties.

◆

The San Francisco *Salon*, which will be held at the Mark Hopkins Institute, San Francisco, in January, is an interesting experiment. In the first place the *Jury of Selection* will be composed wholly of artists instead of photographers, and, as another interesting point, certificates of merit are to be awarded in each of the seven competitive classes. In addition to these awards, *Camera Craft*, our sprightly western contemporary, offers a first and second medal in each class, to be awarded according to the recommendations of the *Jury of Selection.* No charge is made to exhibitors for space given accepted works. In a conversation with Mr. Woods, the manag-

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ing editor of *Camera Craft*, we learned a few days ago that the prospects for a successful exhibition were altogether favorable, a large representation of the best western work being already assured.

◆

The December numbers of *The Photo Era* (Boston) and *Camera Craft* (San Francisco) are both remarkable specimens of modern photographic journalism. If the pace they set can be kept up, 1901 will be a lively year among the craft magazines. A special word of praise must be given to *Camera Craft*, which, although barely a year old, has already reached a monthly circulation of over 6,000 copies. The magazine is beautifully printed, and its contents offer a combination of interest and pictorial attractiveness which justifies the success attained.

◆

Now that the winter is upon us, with its opportunities for delightful snow and ice pictures, the intelligent worker will provide himself with backed plates and a bichromate ray filter. With these all the charming modulations of light and shadow seen in wintry walks may be retained in the negative. Without them the photographic snowscape is apt to be a harsh detailless affair, unworthy of even a passing glance.

The Bausch & Lomb Optical Company, Rochester, have prepared a little booklet concerning their *Rayfilter* which should be seen by those interested. For backed plates, let us suggest a trial of those made by the Lovell D. P. Manufacturing Company, New Rochelle, N. Y. The combination is one well calculated to double the pleasures of photography in winter-time.

◆

Our importation of the library edition of *Photograms of the Year 1900* is exhausted, and it is useless to apply for copies before January 20, by which time we hope to receive a further shipment. A few paper-covered copies are still obtainable at a dollar apiece.

◆

Those who use the familiar *Pocket Kodak* or *Brownie* cameras, for the purpose of securing memoranda where a larger camera is not convenient or available, will find the following suggestion for a walking-cane tripod worth putting into practical shape. It is given by E. B. Fennessy, in *Photography*.

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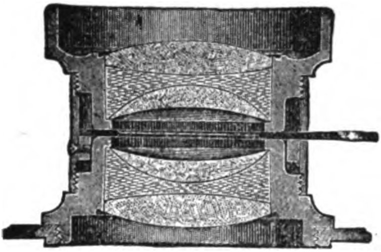

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To form this stand, select a full-length serviceable cane with a bent handle, such as that seen in Fig. 1—a fairly common style. With a fine fret saw—beginning at the end of the handle, split the cane neatly down to about half its length (Fig. 2). Next, on either side of the handle, carve the groove shown at E. To use the cane as a stand, thrust the end into the ground and, placing the little camera between the halves of the handle, it is firmly grasped by the grooves, and held by the spring as at B (Fig. 3). By putting the hand at either side of the camera, it is steadied while the button is pressed to make the exposure. A ring, F, is fixed on the walking cane. This embraces both sides of the split, and may be drawn up if it is necessary to increase the tension of the spring holding the camera. When the camera is not in position the ring is pulled up and keeps the handle together. Lest the ring fall off, it is contrived with a thin rivet which passes through the slit in the cane (see Fig. 4).

Fig. 1

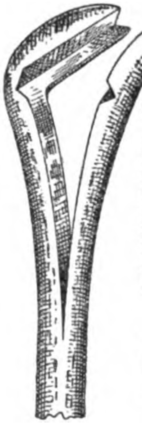
Fig. 2

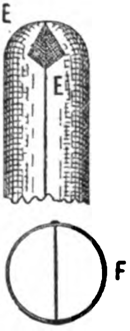

Fig. 4.

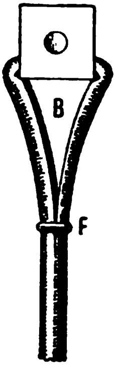

Fig. 3.

* * *

A *Powder Suspending Flash Lamp*, with novel features, has been invented by W. H. Lighty, of Monticello, Ind. The descriptive circular received does not state whether magnesium or a compound powder is used with the instrument, and is otherwise lacking in clearness, but the

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lamp seems to possess good points for both indoor and outdoor work.

◆

Exposure meters have received considerable attention from inventors of late. During the past three months no less than four new meters have come to our table. Two of them, the *Cheape Exposure Meter* (Expodak Co., Charlottesville, Va.) and the *Wager Exposure Scale* (Wager Exposure Scale Co., Philadelphia) are commendable in their simplicity, and in practical trial have given us good negatives under somewhat peculiar conditions. Wynne's and Watkin's meters have also appeared in improved form, and we see *Brown's Exposure Meter* (Burke & James, Chicago) quite frequently in our walks abroad where the hand-camerist is at work.

◆

Zola's New Hobby.—"Pray excuse me," said M. Zola to an interviewer for *The King*, as he crossed the threshold of his comfortable sanctum, "for keeping you waiting. This is the time of day which I usually devote to a new hobby of mine: photography. When you arrived I was developing some snapshots I had taken this afternoon at the Exhibition. Every man should have a hobby, and I confess to a wondrous love of mine. In my opinion, you cannot say you have thoroughly seen anything until you have got a photograph of it, revealing a lot of points which otherwise would be unnoticed, and which in most cases could not be distinguished. Now, pray, take a seat, and let me know what I can do for you."

◆

The man who filtered his hypo used to be a standing jest at one of the London societies, says *Photography*. Why, was not quite clear, especially when it is remembered that this was before the time of granulated or recrystallized hypo, and in the days when straw, paper, wood, and even coal and nails, have found their way into the seven-pound bag. That man was probably a careful worker, one of a class that must always receive the scorn of the slap-dash rough-and-ready photographer, who has barely time to print, let alone to strain the dust and impurities out of his solutions. Yet, with only few exceptions, a stock solution is always the better for being filtered, if it is once granted that solid dirt is out of place in a photographic preparation. For such purposes there is no need to use the tedious and flimsy filter paper,

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useful as such is in its place. A box should be kept in the work-room, in which "absorbent" cotton wool can be clean and handy. Long staple cotton is what is wanted, as the short fibers have a tendency to pass through with the liquid. Then, as a solution is made up, a tuft of the cotton is taken and put at the bottom of a funnel, just gently pushed in, and the liquid poured through it into its bottle. It will be surprising to those who adopt such a plan for the first time how much deposit will be stopped by the cotton, even when the purest chemicals and clean water are used. The only point which requires care is the inserting of the cotton loose enough to filter freely, tight enough not to float up. With the exception of pyro and other similar reducing agents, gold chloride and silver nitrate, nearly every solution is the better for such filtration.

◆

According to the *British Journal*, potato spirit mixed with pyridene is fast coming into favor in Germany as an illuminant, and it is said to be most economical in lamps of 70 candle-power and upwards. The report adds that the gardens of the Imperial Palace of Sans-Souci, Potsdam, are lighted with 220 incandescent lamps burning this spirit. If this illuminant be what it is said to be, it should be admirably suited for the lantern, in place of acetylene or paraffin, both of which have several disadvantages, as the users of them are aware. Possibly, however, this new light may have corresponding drawbacks. If it has not, there is very little doubt it will soon be introduced here, for there is still room for a good illuminant for lanterns where gas is not available.

◆

The new Zeiss lens, named *Unar*, can now be obtained from E. B. Meyrowitz, New York, the American agent for Zeiss anastigmats, who will be glad to send an illustrated circular of the *Unar* to those interested.

◆

A fine example of the technical possibilities of photography is shown in an enlargement just sent to us by C. P. Goerz. The enlargement is from a 5 x 7 negative of a number of horsemen leaping a wall, directly in front of the camera, and not many yards from it. The work was done with a "Goerz" Double Anastigmat Series III, and in the enlargement—which is five diameters, or over thirty inches broad—there is a wonderful sharpness of detail, speaking well alike for the quality of the lens and the skill of the photographer.

THE PHOTO MINIATURE

A Magazine of Photographic Information

EDITED BY JOHN A. TENNANT

Vol. II [illegible] No. [illegible]

GUM-BICHROMATE PRINTING

[illegible]

Gum-Bichromate Printing. [illegible]

From a gum print by F. B. Dyer

THE PHOTO-MINIATURE

A Magazine of Photographic Information

EDITED BY JOHN A. TENNANT

Vol. II JANUARY, 1901 No. 22

GUM-BICHROMATE PRINTING.

Much has been heard during the past two or three years of the gum-bichromate process of photographic printing, and "gum prints," as they are familiarly known, have been increasingly in evidence at recent exhibitions of the better sort. It is fully apparent that the process affords a means of securing certain effects not obtainable by any other photographic method, and some pictures of rare beauty have been produced and shown, setting forth the peculiar merits of the process.

While several little books dealing with gum-bichromate printing are in existence, their perusal seems to indicate the desirability of a simpler, less dogmatic and more interesting statement of the process, the freedom and generous breadth of which, in the hands of the understanding worker, are absolutely at variance with the narrow and didactic lines of the published treatises.

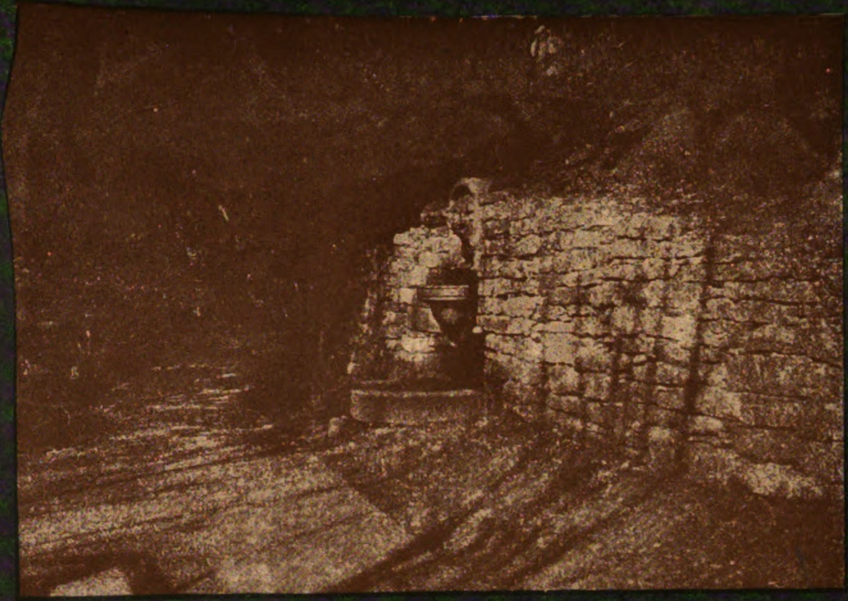
In line with the established policy of THE PHOTO-MINIATURE, I have, therefore, sought for a maker of gum prints who could put in the form of this journal his knowledge of the principles and practices of this modern and most individually expressive printing method. Through the good offices of a friend, I have secured the help of Mr. F. A. Waugh, and the monograph which follows is from his hand. It is, to my mind, a happy bit of work, broad and suggestive in treatment, as becomes the subject, while plain, practical and essentially reasonable in its point of view. EDITOR.

Gum-Bichromate Printing. What is a gum print? At the very outset it seems necessary to tell what a gum print, or a gum-bichromate print, is. Briefly, it is a print made in gum and pigment by the help of potassium (or ammonium) bichromate. The gum may be almost any colloid substance, as white of egg, glue, gelatine, mucilage, gum arabic, etc. The pigment may be any insoluble water color, such as lamp black, umber, ochre, or the colors in pans or tubes used by water colorists. The potassium (or ammonium) bichromate is used in a 10 per cent solution. These three ingredients are properly combined and spread on suitable paper. When the coating is dry the paper is exposed in a printing frame through a negative, just as any other photographic paper is exposed. Now the sunlight acts on the gum in the presence of the bichromate, rendering the former insoluble in proportion to the amount of light action. Thus, under the thinnest or least opaque parts of the negative nearly all the gum is made insoluble, while under the thick or dense portions, in the high lights, the gum remains more or less soluble. The paper is now removed from the printing frame and washed in water, with proper precautions, and with certain necessary but simple manipulations. The soluble gum softens and is washed away, taking the pigment with it and leaving the paper clear in the high lights. The gum, which has been rendered insoluble, holds to the paper, retaining the pigment, and giving the darker parts of the picture. In this very simple manner a positive is secured from a negative.

The print is usually passed through a final "fixing" bath; but this is not an essential part of the process.

Some reference to the history of the gum process will be made later. The ordinary reader will be impatient to get to work; and so, after a brief discussion of the uses and abuses of this process, we will proceed quickly to the practical manipulation. For reasons which will appear later, the gum print has appealed very strongly,—sometimes favorably, sometimes unfavorably,—to the artistic feeling of the best amateurs,—the best photographers, the picture lovers. It has many times become a matter of great contention to determine whether the gum print was altogether bad, or the only process which a self-respecting amateur could use. (It is not a professional photographer's process, and never can be.) Every man, of course, regards his own personal view as the only right one; and so I could not do otherwise, since I am writing this monograph, than to present my argument of the case.

Without Prejudice. It seems to belong to the nature of the case that the artist shall be a partisan. It has been so long and conspicuously true of the painters as to have been often satirized. The painter is almost sure to attach himself to some school or cult, and to send every other style and method straight-



THE FOUNTAIN

From a gum print by F. A. Waugh

way to the bad. Perhaps it is a symptom of the growth of the art element in photography that the camera-men begin to show the same tendency. One worker insists on the superiority of the carbon process and will use no other. The next man will have nothing but platinum. And last of all comes the "gum crank," the worst and craziest of the lot!

The faith which a photographer has in his medium, and his enthusiasm for his particular school, undoubtedly tend to give better results in certain cases, aside from the greater skill of manipulation which one gains by following up a single method. But art should be catholic, not partisan. Every method of expression has its virtues. Every process is peculiarly useful in reaching some proper end. If the photographic worker could only understand all processes, and then, divesting himself of every prejudice, could happily select in each case just that method best suited to the interpretation of his subject, then photography would, at least, be more reasonable, if not more artistic in its results.

The Virtues of the Process.

The reader will understand now that I am trying not to be a "gum crank." I use all methods, as well as I know how. Even the condemned silver print is frequently called into requisition when I am sending something to the engraver. I will even admit that platinum is a more generally useful medium than gum and pigment, and that the "lamplight papers" are better for beginners. But from this point forward I must insist on the virtues of the gum-bichromate process.

These, in my estimation, are as follows: (1) It gives the greatest possible play to the worker's individuality. (2) It gives the greatest possible freedom in changing the print to differ from the negative. (This is what unkind critics call "faking.") (3) It is capable of many soft and "sketchy" effects impossible in other media. (4) It often gives an inimitably satisfactory texture to the image. (5) It gives an unlimited range of colors and tones. (6) It gives greatest latitude in manipulation. (7) It gives absolutely permanent prints; and, (8) It is shockingly cheap,—not more expensive in fact than the blue print process.

I shall not stop to argue about these advantages, a few of which belong equally to other processes. But I take it to be unquestionable that they more especially characterize the gum-bichromate print.

Individuality.

With pictorial photography in its present state of development, no one is going to dispute the statement that it gains in power in proportion as the worker's individuality finds means of expression. Inasmuch as this is one of the most important advantages of the gum-bichromate process, I will illustrate briefly how it operates.

One day while I was admiring the government buildings at Ottawa I took a turn down "Lovers' Walk." (Every shady lane, from Halifax to Golden Gate, is the Lovers' Walk; but that's not here nor there!) It was dark, shady, and secluded. But presently I came upon a drinking fountain in a stone wall against the bank. After some consideration of the situation and its requirements, I made an exposure. When I got home and developed the plate, I found that I had a fine, snappy negative with all necessary detail and with pleasing contrasts. I proved it in *Velox*, and then made a platinum print. Some patient friends whom I cultivate for their always favorable criticisms said it was a fine picture, and how beautifully I had brought out the shady lane.

But the shady lane was not what I wanted at all! It was the drinking fountain, and the mossy, old stone wall, with the gorgeous afternoon light breaking upon it, and the sketchy, scrawling shadow of the old tree through the midst of the light. That was what I saw, and what appealed to me. Of course the gum print occurred to me at once, and I promptly daubed a sheet with lampblack and went about to develop my own notions of what was prettiest of the view in Lovers' Walk. I subdued the shady walk with heavier shadows, and put it further into the background. I spread more sunshine on the stone wall, and brought up the tracery of the tree shadows. Many persons still prefer the platinum print; but I like the gum print because it shows what I saw—because it gives the special effect, rather than the literal fact.

Another Illustration.

This is not, however, the best possible illustration of the uses of the gum print, and especially is it inadequate in suggesting the mental processes through which chiefly a good result is reached. My own experience is drawn upon again, because, indeed, it is the only experience I have.

Beside the walk along which I travel to my daily work and my tri-daily meals there grow twin locust trees. They are the survivors of an old row, and their thrilling experiences and narrow escapes are told in their every lineament. Their straggling, crooked, characterful, aspiring forms stand sketched up against the blue sky, and strike me like a bold chord of music every time I pass. For five years I loved those locust trees and watched them, and finally decided to photograph them. Now there was nothing but the locust trees to photograph. The only

LOCUST TREES
From a gum print by F. A. Waugh

other object which could be brought into the composition was the old-fashioned house over which they watched. The only beauty and the sufficient beauty of the locust trees was in their outlines. Not a half-tone was wanted. The whole problem was to catch the spirit of that sketchy silhouette, and to give just enough atmosphere to serve as a background for it. In other words, this was a gum-and-pigment study before the camera was set up. The negative was made for the gum paper,—slightly under-exposed and strongly developed,—clean and snappy. That is the way one ought always to work,—though I seldom do it,—foreseeing the print from that moment when the composition first begins to form in the mind.

"Faking."

I am aware that the "expression of individuality" has been a convenient cloak to hide a multitude of foolishness. Much silly and unworthy work has been excused as the "expression of individuality." (Parenthetically, if a man has no individuality he can't express it; or if he has a wobbling, crude, uncultivated individuality, the expression of it is worse than the stereotype of an honest fact!)

There is a prejudice against "faking." The term is used as though it were complete condemnation and punishment in itself. Now I take it that no line can be drawn between honest and acceptable expression of personal feeling and "faking." Every stroke of the retouching pencil, and every modification of tone is, in a sense, "faking." But it is not subjected to the obloquy of that name unless it passes the point of being agreeable to the critic. If a man is working in the right spirit, with a worthy end in view, and with an intelligent understanding of the means which he employs, I don't care how he arrives. He may print from one negative or six; he may make his print moss green or copper red; he may smear it with his thumbs, run it through the clothes-wringer and hang it either side up, just as he pleases. If the result is expressive, I am satisfied. And when some bilious patient says, "Oh, well, that may be *art*, but it is not *photography*," I would remind him that art is greater than photography. Art is the end: photography a means. It is a very common, human sort of a sin to exalt the means above the end, good philosophy notwithstanding.

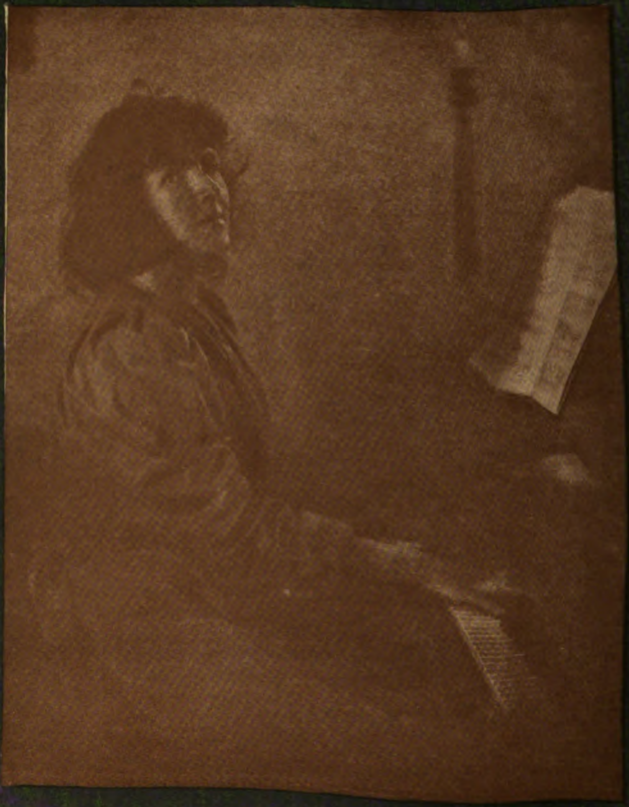
Suitable Subjects.

The gum-bichromate print is not suitable for every purpose. It will not even give the most pleasing result in the treatment of every subject. It is generally said to be specially indicated for broad, sketchy effects; and perhaps this phrase comes as near covering the case as can anything short of personal experience. I find it particularly useful for the fine texture it gives, especially with lampblack. This texture gives the best rendering I have ever seen for old mossy stones, for dilapidated architectural masses, light and shadow on old tree-trunks, and the like. It is incomparably useful in showing trees, especially when leafless and when only the outlines of the trunks and tops or the tracery of the branches are wanted. I find it difficult to interpret water surfaces in most compositions (though not in all) by this process. It is difficult to print in clouds which may be in the negative, but supremely easy to "fake" in clouds not in the negative. All sorts of skies, except the blank white vacuum of the collodion print and the variegated sunset of the bromide print, may be rendered with wonderful facility. It is not generally useful for portraiture, though it gives the happiest results in certain cases. Very fine details are usually lost, though excellent detail may be secured from certain negatives by suitable treatment. Half-tones are apt to suffer in gum printing, and the subject which holds its beauty in the richness of its half-tones had better be worked out in carbon or platinum. Contrasts, when in small areas and closely adjacent, are subject to damage; but contrasts in areas large enough for local manipulation may be heightened and thus rendered more effective.

Latitude in Manipulation.

In some printing processes every step has to be taken precisely so, or the whole result is spoiled. The gum-bichromate worker should understand at once that he is not tied to any such formula. He may use any paper, any colloid, any pigment, almost any proportion of bichromate, mixed in almost any way, printed anywhere from five minutes to an hour, developed in any manner, in any light, and "fixed" by a hypo wash, by an alum bath of any strength whatever, or by any of a dozen other baths which may come handy. One of the most remarkable things about the process is the latitude which the photographer has in almost every step and detail of the work. The incomparable opportunity given for "the expression of individuality" is largely due to this freedom which one enjoys in the mechanical parts of the process.

This fact has another important bearing to which the attention of the beginner should now be directed. It is highly impracticable to give detailed and precise directions for a process which presents such extreme latitude. If one tries gum printing by recipe he may possibly get the substance of the method, but he is certain to lose the spirit. It is not a process of rule or rote. It is preëmi-



Gertrude Käsebier

nently one in which the worker *feels his way;* and there, I take it, is where the heart of the matter lies. The worker feels his way,—that is, he objectifies his art feeling. If a man cannot feel his way he has not the art-feeling, and is not an artist. But let the beginner console himself from the start that his success with the gum-bichromate process does not depend on his slavish conformity to the details of anybody's prescription.

How to Begin. The directions for gum printing as given in most of the books are enough to frighten the timid novice away from the process forever. What does he know about Michallet, Allongé, moist tubes, complicated sensitizing methods, "pitched badger blenders," special actinometers, and all that? Those things are for the chap who has arrived—for the fellow who makes the salon committee crazy with his smudges! The beginner wants nothing, or next to nothing, beyond what he has already in his dark-room. Fifty cents * at most will provide him everything he needs for his first month's experiments. These things are: Paper; gum arabic, powdered, an ounce, (or some mucilage); potassium bichromate, 10 per cent solution, 4 ounces; lampblack, 5 cents' worth; burnt umber, 5 cents' worth; and a flat brush.

The paper need not be an imported *Rives.* It may just as well be a good linen bond, such as many business houses use for letter writing, though if it be a trifle heavier it will work better.

With these things in hand let the practice begin. When the old surgeon took the man's eye out of its socket, scraped it and brushed it and put it safely back, the dumfounded student standing by cried, "Well now! that looks easy!" "Young man," said the old doctor, "that looks very easy, but I spoiled a whole hatful of eyes learning it." It is probable that the novice will spoil some sheets of paper before he becomes an expert gum printer, but the chances are that he will have lots of fun doing it.

Making the First Print. To the man who has never seen a gum print gummed and printed the description reads like the directions for a legerdemain performance. He has his doubts about what will happen to such an absurd mixture of gum, bichromate and pigment smeared on a piece of paper, exposed in the sun and washed in water. The first thing for him to do is to test the principle in the simplest and most expeditious way possible. To do this proceed as follows: Take a sheet of good, firm white writing paper and pin it to a board by the corners. Pour a spoonful of fresh clean mucilage into a saucer. Measure another spoonful of a 10 per cent solution of potassium bichromate and pour it into the mucilage. Take about a quarter of a spoonful of burnt umber, or a little less of lampblack, and work it smoothly into the gum-bichromate solution with the brush. Spread this thinly on the paper, wiping the brush half dry and going crosswise of the paper immediately after the first coating. Set this in the dark to dry.

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* For the English reader: The cent is equivalent to the halfpenny.
—EDITOR.

Now choose a suitable test negative. Take one without much half-tone, but with strong contrasts and clear glass shadows. When the paper is dry expose it through the negative in a printing frame for fifteen minutes, in direct sunlight. Remove the paper and put it in a tray of water, face down, to soak for a minute or two. Then turn it over and put it face up on a glass plate. With a small wad of absorbent cotton, brush along the edges of the print under water. The gum and pigment on the edges will quickly loosen and wash away. Then presently, in two or three minutes, the high lights should begin to appear. If the print has been sufficiently exposed the whole may be gently sponged under water with the tuft of cotton. Or if the exposure has been somewhat ampler, the print may be lifted out of the tray on the glass plate and sponged more freely. The print which I like is the one which can be developed in four minutes' sponging like this, but which one spends an hour over, holding it at a distance, twisting one's neck, taking it out into the light to get the effect, while one feels his way gently to the best result.

This will make some sort of a gum print, if not on the first trial, then on the second, or third, or fourth. The first print need not be finished. 'Tis not what 'twas made for. It has served its purpose when it has introduced the experimenter to the new and fascinating business of gum printing and its possibilities.

Beware of Recipes. I have already pointed out the extreme latitude in manipulation which the gum-bichromate process offers. Some are not satisfied to have it so. They insist that there must be one *best* way; and that, as soon as that is discovered, it may be formulated and closely followed thereafter. I have seen several articles on gum printing which insisted strongly on certain recipes,—giving the exact proportions of gum, pigment and sensitizer, and reiterating that such proportions should be scrupulously observed. Now this is radically wrong in principle, and disappointing in practice. All the possible variations in pigments, in gums, in printing, and in "developing" are useful to the skilled worker who understands them and who can intelligently feel his way to a foreseen result. Such looseness of method certainly does not give two pictures alike. That is not an objection to it, though, but a recommendation of it. Who wants two prints alike? Did Turner or Chavannes or Inness ever paint two pictures alike? *Ungereimtheit!*

Any semblance of recipe, then, which may appear in these pages is disclaimed in advance. Definite directions are given only as starting points for the experiments of the learner. If he has any pictorial feeling and any manual dexterity he can readily develop the process to suit himself.

It should be said further that most of the statements following are based chiefly on the writer's own experiments. There has not been the opportunity which might have been desired to confer with other gum printers and to learn their methods. The one thing certain, however, is that those methods cannot agree; so that, if the beginner takes the following suggestions along with the reservations so strongly insisted upon, he will soon find himself on the right track.

Paper. The character of the print depends very largely on the paper that carries it. The worker thus has his first opportunity for the display of his taste in selecting the paper. The latitude here is quite as great as at other points. Almost any paper, of any color, weight or surface may be chosen. Very thin papers and those with a bibulous texture are chiefly to be avoided. I have made fairly good gum prints on manila cardboard. Some of the cheaper papers are excellent. I have had happy results with a heavy bond paper which I bought at the printery at about sixteen cents a pound. The finer grades of polite note paper are very satisfactory. Drawing paper, or such as is used by water colorists, is always satisfactory. The finer grades of paper used by architects for blue prints, such as *Helios*, are very good, especially to begin with. Later one will naturally take up the better photographic papers, like *Rives*, *Steinbach*, and *Johannot*. *Whatman's* "hot pressed" is a favorite; while for broad and sketchy effects, such rough surfaces as are offered by *Lalanne* and *Michallet* are very attractive to many workers. According to my experience, the rough papers are more easily worked than the smooth ones; but they are all good. The reader who seeks the greatest freedom for his work will want every kind he can get his hands on. I have found some difficulty in buying the better imported papers, as few dealers carry them in stock; but a special order put through the local dealer in art supplies will, of course, obtain any paper in the market.

Sizing. It is generally recommended that the paper should be sized before coating, even though a sized paper be used. According to my experience, sizing is time wasted. Perhaps if I did my "developing" under the spigot I should find sizing more useful; perhaps not! The two formulas which I have tried are as follows: (1) Make up a 3 per cent solution of arrow-root and apply hot with a brush. (2) Mix together in equal parts a 5 per cent solution of gelatine and a 2 per cent solution of chrome alum; apply hot. The paper should be pinned to a board before the sizing is applied, and may be conveniently left there until it is dry, which will take only a very few minutes. The next step in the process should be delayed, however, till the size has set and the paper is thoroughly dry.

Colloids or Gums. A colloid, or colloid substance, is any amorphous, non-crystallizing, jelly- or glue-like material, of the nature of albumen, gelatine or glue. Theoretically, any of these compounds may be used in gum printing, though practically only a few of them are desirable. White of egg, which is almost pure albumen, works beautifully, so far as the chemical part of the process is concerned, but it is refractory in a mechanical way. It proved quite impossible, in my few experiments with this colloid, to spread a smooth film, and I very soon discontinued its use. Gum tragacanth is very difficult to dissolve and to work, and does not react well with the bichromates. Gum guaiacum dissolves easily, but makes a poor film, and does not respond to the action of the light. In fact, I have found it impossible to make even a very bad print with this gum. Gelatine has some very good points and some drawbacks. The primary difficulty is that it requires to be worked at comparatively high temperatures. It has to be brought nearly to the boiling point to dissolve it, and "development" has to be conducted in water almost as hot. After the gelatine is dissolved (in about 1 part to 4 or 5 of water) it should be allowed to cool slowly. When partially cooled, it should be mixed with the bichromate and pigment, and the cooling allowed to go on slowly. Presently a point will be reached, just before the gelatine begins to set, when it spreads beautifully from the brush.

If taken just at this moment, gelatine works very satisfactorily, and gives a thin, smooth, even film,—the *first and most important requisite for a gum print.* Gum arabic, however, is the most popular colloid with gum printers, and, all things considered, is the best for general purposes. In order to get it pure, one is generally recommended to buy the "crystals" or "tears," and to pulverize them in a mortar; but I have found it entirely satisfactory and much more convenient to buy the powdered gum of a reliable wholesale chemical supply house. Good mucilage, just as it is bought of the stationer, is really a very good gum for pigment printing.

Handling the Gums. There are various methods of handling these gums. Some persons prefer to mix them fresh every time a new sheet of paper is coated. This is the way I usually do. Others prefer to make them up in solution and keep them on hand. This is practicable with gum arabic. It can be made into a 20 or 25 per cent solution, or considerably stronger if one prefers, by rubbing it up in a mortar with *cold* water. It is then bottled and stoppered; and a few drops of formalin, chloroform, or menthol may be added as a preservative. In this way it will keep a month or more.

It should be observed that gum arabic, and every other colloid, where possible, should be worked up in *cold* water. Most of these gums are of unstable chemical composition, and are liable when heated to undergo such changes as interfere with their subsequent usefulness.

The Bichromates. Either potassium bichromate or ammonium bichromate may be used. The former costs one-third as much as the latter and does almost or quite as well. I think I prefer the ammonium bichromate, though I am not very sure about it. It seems to give a film which prints somewhat more rapidly than that made with potassium bichromate. One article on this subject which has come to my notice advises mixing the two bichromates in equal parts for gum printing; but there is no reason for this and no advantage in it. These salts should be made up in 10 per cent solutions for gum printing, though a 5 per cent solution will do equally well under many methods of manipulation. A 10 per cent solution is practically saturated, and cannot be made without heating the water considerably. The solution can be made up in any quantity to fit the bottle and kept for months. It is best to filter it into a black or amber bottle and keep it in a dark place.

Pigments. Any coloring matter whatever, if it be not too soluble in water and not mixed with oil, may be used. The available colors are of two general classes—moist and dry. The moist colors are those commonly used by painters in water colors, and can be bought in little pans or in collapsible tubes. The dry colors are the dry ground pigments, also frequently used by water colorists. The common dry colors used by house painters are all available if clean and finely ground. Common lampblack is one of the best.

There is some discussion as to whether the dry or the wet colors are the better. It depends entirely on which gives the better results; and this in turn depends on the individual worker and on the methods which he adopts. I prefer the dry colors, though I use both. Many persons favor the dry colors because the quantity to be used can be more accurately measured; and others say that they prefer the moist colors for the same reason. But this is no reason at all, to my mind. I never measure my pigments, for I never want the same color twice. I find it more satisfactory to mix and tone each batch as it is wanted, trying a little with the brush on a sheet of paper, and taking it into the sunlight to look at it a dozen times during the process.

The colors which are best for general work are the following, given approximately in the order of their usefulness: Lampblack, burnt umber, burnt sienna, Indian red, red ochre, Venetian red, and Van Dyke brown. Sepia, though a beautiful water color, is apt to make too weak a print. To get sepia shades in gum prints it is better to use burnt umber toned with Venetian red. All the shades of brown can be made by using these two pigments in varying proportions, or by mixing Prussian blue and Venetian red. Greens are obtained by mixture, and other mixtures of color will suggest themselves to the experimenting worker, or will be fully known in advance by the one who has studied painting.

Dry colors should always be clean, and finely and evenly ground. In case they are not well pulverized this should be remedied by rubbing them with a flexible knife on a glass plate, a marble slab or a heavy palette. I have heard of a specially prepared artists' lampblack, but I have been unable to find it in the market. The ordinary sort does very well. Many workers practice squeezing the gum-bichromate-pigment mixture lightly through a piece of thin linen cloth the last thing before spreading, thus removing any lumps.

From a gum print by F. A. Waugh

Brushes. The gum-bichromate worker will need one or two brushes. The long-lost "gum-crank" uses a dozen or so. The beginner should have a flat camel's hair "spreader," with a blade 2 or 2½ inches wide. A good brush of this sort will cost 50 to 75 cents at the art store. At the hardware shop one almost equally good can be bought for 25 cents. Along with the spreader a badger's hair "blender" is very useful. In fact, one should not dispense with it after his work arrives at the serious stage. Between these, an artist's flat "softener" is often convenient, though, if one has a good spreader and knows how to use it, a very few touches with the blender will finish a film without the intermediate use of the softener.

Other Conveniences. The essential apparatus and materials have been described. Beyond these there are many small conveniences, most of which the worker will invent for himself to suit his circumstances as his work goes on. In the first place, there ought to be a clean board, say 2 x 3 feet in size, on which the paper can be pinned for treatment. A small supply of thumb tacks will fit in nicely, though strong pins are a good substitute. Some developing trays will come handy. I like a large porcelain tray, about 12 x 14, for "developing." There should be some tufts of absorbent cotton within reach. A "fixing-bath," 4 to 8 ounces of a 5 per cent solution of potassium-aluminum sulphate (common alum) is useful, but not always necessary. If the bichromate bath is to be applied separately and several sheets are to be sensitized at once, a clothes-line will be wanted, with some wooden clips suitable for hanging the wet paper up to dry.

Coating the Paper. There are two general methods of putting the film on to the paper. I will describe first that method which includes everything in one operation—which I prefer.

The gum, the bichromate, and the pigment are all mixed together, as already explained under the head of "Making the First Print." If gum arabic is used, it may be made up into a 25 per cent solution, and put into the mixture exactly as explained for the mucilage in that initial experiment. Or it may be put dry into the saucer (I use a 4-inch glass petri dish), wet with the bichromate solution, and carefully rubbed up into solution with the brush. This gives the advantage of a perfectly fresh gum solution each time. Gelatine, as before noted, has to be dissolved in hot water, made up with the bichromate and pigment, and spread just at the happy moment.

When the gum and bichromate are properly mixed together, the pigment is added, a little at a time, and carefully worked in with the brush. If one is properly "feeling his way" at this he will make frequent tests of the color on a clean piece of paper and will tone it to suit his taste for the particular print which he has in view. (Making up paper in quantities, to be used for all sorts of unknown subjects, is to be hotly discouraged.) The mixture in the dish should be deepened and toned until, when thinly spread, it will give just the depth of color wanted in the heavy shadows of the finished picture.

Texture of the Gum.

By this careful testing of the pigment mixture, one arrives not only at the proper tone; but, what is fully as important, one gets just the texture of gum which will spread smoothly with the brush. Some experience is necessary to determine this; but the worker will soon discover that the mixture may be too stiff, in which case it streaks under the brush, or it may be too watery, in which case it runs about, draws itself up in bubbles, and performs generally in an unpleasant way.

It is important that too much pigment be not added. This spoils both the printing and the developing qualities of the paper. A thoroughly over-pigmented film is lost. A very small quantity of color will do. There is such a thing as getting too little, but not if one adheres to the simple rule of making the coating as dark as the heaviest shadows are to be in the finished print. The completed film, gum, pigment and all, should be just as thin and even as possible.

The Point of Skill.

To spread this film quickly, thinly and smoothly upon the paper requires some manual dexterity, and this is hardly to be gained without practice. This is, I think, the only difficult part of gum-bichromate working, and it is very hard to give directions for it. The paper must be pinned firmly, and the work must be done quickly. Avoid taking up too much of the color on the brush at once. Make strong, firm strokes, carrying the brush lengthwise of the paper, and allowing each successive sweep to overlap the previous one slightly. When the whole sheet is covered in this way, the spreader should be already nearly dry. If it is not, it must be quickly dried by wiping it firmly over the edge of the saucer. Then go over the paper again crosswise. This time press the brush to the film more lightly, hold it *vertically* and loosely in the fingers. Make all these cross strokes in one direction. If this is successfully done, the film will be pretty well finished at the end of the second brushing. If any streaks appear where the brush marks lap, these may be gone over very quickly and very lightly, moving the vertical brush in the same direction as at the last stroking. If one uses the softener, it is taken in hand for this latter operation. Finally, if there are still some slight streaks or inequalities visible, the blender may be applied. Hold this loosely, always vertically, touch the film very lightly, and be quick about it! A thinly spread film will dry enough in 30 seconds so that the brush will streak it and do more damage than good.

Drying in the Dark. The board is then set up in the dark-room for the paper to dry. A thin film will be dry enough to apply to a negative safely in 15 minutes; but there are usually wet spots along the edges of the paper, so that it is much better to wait two or three hours at least.

It will be understood, of course, that the mixture of gum and bichromate is sensitive to the light, though either one alone is not. From the point at which they are combined, therefore, the work should proceed in subdued light. A dark-room, with the work going on at a distance of 6 to 8 feet from a single incandescent burner, I find safe enough.

Paper made in this way will keep for a month or two and will work very well at the end of that time. Still it is much better, from whatever point of view regarded, to make up the paper fresh from day to day as needed. When one is freshly struck by a consuming inspiration, that is the time to make a paper just to suit and to work out a print worth a whole wheelbarrow load of the ordinary sort.

An Alternative Process. The process just described is really the original "photo-aquatint or gum-bichromate process" first described by Maskell and Demachy. The same workers added the alternative process, preferred by many workers, in a subsequent postscript to the original publication. This improvement, as they thought it to be, consists in dividing the work of coating the paper into two distinct operations. The bichromate solution is applied first. To do this a sufficient quantity is poured out into a tray and the sheets of paper are floated on it, or immersed in it. Considerable care has to be exercised in doing this to avoid the formation of air bells. The paper should be handled sheet over sheet, by withdrawing the lowermost and putting it back on top, again withdrawing the bottom sheet and transferring it to the top, and so on several times. Finally the sheets are drawn out over the edge of the tray, or over a glass rod, so as to free them from as much of the liquid as possible, and are hung, or pinned, up to dry. This work is better conducted in a dark room, or in weak light. Working in this way, it is most convenient to treat a number of sheets in a single bath, and when they are dry to lay them away in the dark between the leaves of a large book, or into an empty negative box with interleavings of soft clean paper. In either case some slight weight should be applied to prevent curling.

The pigment and gum are mixed together and spread upon this bichromated paper as needed. The mixing of the pigment and gum and their application to the paper follow in the same way as described for the previous process. The paper must be thoroughly dry, however, before the second coating is given. This rule must be strictly observed.

This method is said to possess several advantages, none of which I could ever demonstrate. The principal claim made for it is that it makes the paper much more sensitive, reducing the necessary exposure to one-half or one-fourth that required for paper prepared in the other way. I have not found any such gain, and cannot see what advantage is to be derived from a faster printing, anyway. By all means let every one try it for himself, however, and adopt the method which gives the best results in his own case. It is the only way to succeed with the gum-bichromate process.

Miller's Method. Still another method has been recently proposed by Dr. Caspar W. Miller, in a paper presented before the Photographic Society of Philadelphia, October 10, 1900. Dr. Miller's process consists essentially in rendering the gum partially insoluble before exposure, thus allowing the paper to be coated with the gum and pigment and stored, to be sensitized by soaking in the bichromate solution later. The two advantages claimed for this method are (1) that it permits the worker to make up paper in quantities and to keep it in stock indefinitely, or (2) that the paper may be coated commercially and sensitized by the user as needed. The manipulation is, briefly, as follows: Two stock solutions are made. *Stock solution A*—Water, 100 c.c.; gum arabic, 35 grams; salicylic acid, 0.25 gram. *Stock solution B*—Water, 100 c.c.; chrome alum, 3 grams.

Solution A is to be dissolved without heat. This can be done by frequent stirrings, or by rubbing up in a mortar. Both solutions keep indefinitely. When ready

From a gum print by F. A. Waugh

for use they are combined with water and with the chosen pigment, the following formula being merely a suggestion: Stock solution A, 10 c.c.; stock solution B, 1 c.c.; water, 1 c.c.; carbon black, 0.1 gram. These should be ground together in a mortar, and the paper coated in the usual manner. After coating, the paper is allowed to become thoroughly dry, and may then be stored for future use, or may be sensitized at once. Whenever the sensitizing is to be done the paper is immersed for two minutes or so in the bichromate solution. (Dr. Miller recommends a 5 per cent solution.) The paper is dried again, and is ready for use. On account of the partial insolubility of the gum, paper made after this formula will require comparatively long exposure, and this increased exposure will be proportional to the increased insolubility, which in turn will vary with the amount of chrome alum used in making up stock solution B.

Printing. Papers prepared according to the "feel-your-way" rule urged here vary so much in sensitiveness that no general estimate of the time required for printing can be put forward. This is the most serious objection to the feel-your-way method. In general it is said that the exposure needs to be about the same as for ordinary printing-out paper; and printing-out paper is sometimes used as an actinometer for the gum-bichromate paper. Elaborate actinometers are usually described in connection with this process; but it seems to me to be harder to learn to run the actinometer than to learn to estimate the exposure outright. When light-colored pigments are used the image is distinctly visible on full exposure. It is almost as visible as the undeveloped image on platinum paper, and has somewhat the same appearance. This is better than any sort of an actinometer, when it is available.

Time for Printing. The time given to printing will depend very largely on what sort of development is to follow. If one prefers to wash the print out by gentle pouring, the exposure should be half or one-third of what it will be for the more vigorous sponge development. This is one of the points which specially requires proper adaptation to the other steps adopted by the individual worker. And this is another reason why the actinometer gauge is particularly useless.

Length of exposure will depend further on the thickness of the film, and more especially on the color of the pigment. Lampblack and burnt umber require twice the exposure of an ordinary light brown or sepia.

Beginning with lampblack and burnt umber,— certainly the best two single colors,—selecting a moderately thin, "contrasty" negative, and printing in direct sunlight, the trial exposure may be twenty minutes. It should be remembered that a print considerably overexposed may nearly always be saved, whereas an underexposure is a certain failure and without remedy.

"Development." The development of a gum print consists simply in washing out the gum which remains soluble, and with it the pigment. There are many important variations in this part of the manipulation. The method usually advised may be called development by pouring. The print is first soaked for a minute or two, or sometimes much longer, face down, in a tray of water. It is next turned face up on a plate of glass—an old cleaned negative answers as well as anything—and fastened at one corner by a small clip. It is then gently laved with water poured from a beaker or graduate. If the exposure has been exactly correct, and an equal development is desired, this treatment ought to succeed within three or four minutes in bringing the image well into sight. If development lags, indicating overexposure of the print, more vigorous methods are brought into play. The water is poured more vigorously, or from a greater height, or the print is brought under the tap and the city water turned on at its full force. Or some fine boxwood sawdust, or fine sand, is mixed with the water and poured over the print. A print which refuses to develop at first will often work very freely after a half hour's soaking. If a half hour is not enough, an hour or two hours may answer. In other cases it is found most effective to raise the temperature of the water. This softens the gum much more quickly. Allowing the print to soak for a few minutes in water at a temperature of, say, 150° Fahr. has a wonderfully softening effect—like a bottle of champagne after dinner!

A print which is sufficiently exposed may be handled very roughly without suffering any damage. If it is exposed just enough, so that it will not develop by pouring, the best treatment is often given with a tuft of soft cotton. At first the print should be allowed to lie face up on the glass under water, while the cotton tuft is gently run along the edges where the printing frame has covered the film from exposure. This part of the film, except in case of a gelatine foundation, will very quickly wash out, and as it comes out to the line where the exposure begins, the operator very quickly gets an idea of the way in which the print is going to develop. The tuft of cotton is moved very lightly over the print under water, the water serving to soften the force of the rubbing very much. This gentle rubbing may bring up the high lights presently. If they begin to appear at the first stroke or two, further development must be conducted very carefully. If they do not appear at once, rubbing may be continued and made a little harder, and presently the glass plate with the print may be lifted from the water and the wet tuft of cotton applied directly, but lightly, to the film. A print which is exposed just enough to develop under this treatment is the one most easily manipulated. If exposure has been a trifle longer, the rubbing will have to be a little more severe, but harsh scrubbing is always to be avoided. Such treatment will seldom or never bring out a print without spoiling it. In case the light rubbing is not successful in bringing up the high lights within three or four minutes, the hot water treatment will have to be resorted to again, as in the former case. Gelatine seems to require hot water always. The print can be put directly into the pan of boiling water over the fire, and allowed to cook for two or three minutes, and can then be lifted out on to the glass, and brushed with the cotton tuft full of hot water.

Tentative Work. In all this development, however, the one thing supremely necessary is that the worker go gently—that he "feel his way." As the picture comes to view under the touch of the cotton tuft, or through the water flowing from the faucet, he must guard the film to prevent overdevelopment where it is not wanted; and he will naturally bring out most strongly those parts which he wants to emphasize, or those which he prefers to have most conspicuously lighted. The work is not greatly unlike that of making a water color sketch proper, and the internal feelings which go with it are altogether the same.

"Fixing." When development is finished and the print is examined in bright light (by the way, development may be carried on in the open light), it will be found to have a considerable yellow stain, due to the bichromate. This can be removed in various ways. A plain hypo bath will do it; but the best clearing bath is a 5 per cent solution of common alum. This alum solution may be of any strength, from 1 to 25 per cent; but the 5 per cent solution is about right. Prints which have been so fully exposed as to have required the harsher methods of developing described above can usually be lifted directly from the glass plate into the alum bath. Underexposed prints, or those in which, for any other reason, the film is soft, should be dried first and sent to the alum bath afterward. Otherwise they will sometimes soften and float off the paper, or run together like the colors in a cheap calico dress. And that's discouraging!

The yellow color of the bichromate, or just a suggestion of it, is not objectionable in some prints on some papers, especially in those made with lampblack. There is no reason why such prints may not be removed from the clearing bath before the bichromate is entirely cleared away. They will need to be closely watched, however, to see that they are taken away at just the proper moment, and carefully handled to see that they are not streaked.

Prints will need to lie five or ten minutes in the alum bath to be thoroughly cleared. One can always decide by examination whether they are done or not. When they are taken out they should be hung up by one edge or one corner to drain. If they are laid out flat on blotters the alum is apt to collect in spots and stain them.

Finishing.

The fixing bath should take out all the active bichromate, and all the soluble gum has probably been removed in development, so that the print when fixed and dried is as permanent as the paper on which it is made. Lampblack and linen paper are about as permanent as any materials which can be found; and a gum print ought to last forever-and-a-day. To prevent scratching, however, as well as to add a certain sort of luster to the print, a varnishing is sometimes given. The same varnish which is applied to crayon drawings or water color paintings will serve best. This may be made of one part of mastic varnish dissolved in 6 parts of 90 per cent alcohol, and should be applied with an atomizer.

Sometimes prints need retouching. This may be done by mixing a little of the same color and applying it with a fine-pointed brush. Occasionally it will be found feasible to apply a little of the gum-bichromate-pigment solution from which the film was made and to hold this in the light till the chemical reaction renders the gum insoluble. This sort of retouching is usually resorted to while development is still going on.

Historical Sketch.

Those who have gone through the experiments suggested, and who have become interested in the process of gum printing, will perhaps care to know something of the history of it. Although it is sometimes exploited as something new, it is really almost fifty years old. The principle on which the process rests seems to have been set forth first by Poitevin, a Frenchman, in 1855, but no special record of his experiments has been left us. In 1859 Pouncy read a paper before what is now the Royal

From a gum-print by Frank A. Perret

Photographic Society (London), giving full directions for making prints by this method. In 1863 William Blair made and published additional experiments in England. Pouncy seems to have made serious use of the process in picture-making; but it really gained no general notice until very recent years. In 1895 and 1896, if my information does not mislead me, Alfred Maskell and Robert Demachy began to exhibit some particularly excellent gum prints at the Paris photographic salons. In 1897 they published their process in a pamphlet entitled *Photo-Aquatint, or the Gum-Bichromate Process, with illustrations. A Practical Treatise on a new Method of Printing in Pigment, especially suitable for Pictorial Workers.* This was the beginning of the end. The time was ripe for the introduction of such a process, and it has had a phenomenal vogue. Like everything else which has a vogue, much has been claimed for it which does not belong to it, and many persons have dabbled in it who are not suited by temperament or education for that sort of work. The process has been shamefully misused by some of its misguided friends; but at present it seems that a more rational view is being taken of it, that more serious and thoughtful work is being done through it, and that for years to come the gum-bichromate process may be one of the accepted and accredited means of photographic expression.

Works of Genius.

Editor's Note.—The illustrations accompanying these pages give an approximate idea of the possibilities of the methods herein outlined. If genius is truly said to be an infinite capacity for taking pains, then these illustrations are works of genius, for verily they are the result of considerable "pains" at the hands of the makers of the originals, the engravers, and last, but by no means least, the printers. My thanks to all!

BOOKS

Photo-Aquatint, or the Gum-Bichromate Process. By Maskell and Demachy. 1898. 2d ed. 55 pp. 50 cts.

The Gum-Bichromate Process. By W. J. Warren. 1899. 75 pp. 50 cts.

Modern Printing Processes. By Henry G. Abbott. 1900. 66 pp. Illustrated. 35 cts.

The Gum-Bichromate Process, a monograph by Henry Wenzel, Jr., to be found in the *American Annual of Photography for 1901*, also deserves mention as a recent American exposition of the subject.

NOTES.

THE PHOTO-MINIATURE desires to put on record two events which, although of little public importance, were delightfully interesting to all concerned. The first affair was an informal dinner given by Mr. W. I. Scandlin, editor of *Anthony's Photographic Bulletin*, to Mr. William Edward Ward on the eve of his departure for England. It was a happy gathering of congenial souls, and the overworked scribe, who "let things slide" to be present, enjoyed the flow of reminiscence and wit which spiced the more substantial details of the feast. After the usual toasts had been honored, the talk ran on from men to things, past, present, and to come. Mr. Scandlin outshone himself as the amiable host, and the guest of honor was in his merriest mood. It was a memorable occasion. Mr. Ward sailed on the *Cymric*, January 9, carrying with him the good will of all who have known him on this side of the Atlantic. The other affair, which the scribe, most unfortunately, could not attend, was the midwinter dinner of the *Brush and Lens Club*, given at the United States Hotel, Boston, January 2. The guests of the evening were Mr. Histed, Mr. Core, Mr. Pirie MacDonald, and another, of New York. That this was another memorable occasion there can be no shadow of a doubt, but the only information received begins and ends: "The New Englanders are all right." An indisputable fact.

❧

Fra Elbertus, maker of *Little Journeys*, *The Philistine*, and other joyous things, post office address, East Aurora, New York, has discovered Pirie MacDonald, of Albany, and great is his delight therein. Every one who knows Pirie MacDonald should get the January *Philistine*, whether it costs ten cents or a dollar, and enjoy the "Heart to Heart Talk" devoted to MacDonald. It is the best thing of its sort we have yet seen and worthy of its subject. Mr. Pirie MacDonald, by the way, has for-

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⁂

A peculiarly interesting description of the carbon print, as employed in the reproduction of paintings, has been issued in the form of a *brochure* by Franz Hanfstaengl, New York. It was prepared, we hear, by Mr. Charles W. Canfield, and is a happy bit of bookmaking, apart from its virtue as an advertisement. Seven half-tone reproductions from "old masters" add to its attractiveness.

⁂

The Traill Taylor Memorial Lecture, No. III, 1900, entitled *The Optics of Trichromatic Photography*, given by Frederic E. Ives before the Royal Photographic Society, London, is published *in extenso* in the November, 1900, issue of *The Photographic Journal*. It is a valuable addition to the literature of the subject, and should be seen by all interested. [Harrison & Sons, 59 Pall Mall, London, S. W. Price, 30 cents.]

⁂

Eduard J. Steichen contributes to the January *Photogram* a glowing appreciation of "The American School," which is illustrated with examples of the recent work of Mrs. Käsebier, Mrs. Sarah C. Sears, Clarence H. White, E. J. Steichen, Francis Watts Lee, Frank Eugene, Mrs. William E. Russell, and Miss Mary Devens. An illustrated critique on the same school, by A. C. R. Carter, is announced to appear in the February issue. [Spon & Chamberlain, New York. Price, 15 cents per copy.]

⁂

A well-known New York dealer recently supplied, to

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an equally well-known photographer, packages of carbonate and hyposulphite of soda without labels or other means of identification. Strange, but true. Equally strange, and equally true is the ending of the story. The well-known photographer mixed up a "hypo bath" with the unlabeled carbonate, and thereby ruined several valuable negatives obtained under difficult conditions and at the expense of a journey out of town! And yet is it not written that if the blind lead the blind they shall *both* fall into the ditch? The moral is obvious.

❧

The Evolution of the Modern Lens, a lecture given by Mr. T. R. Dallmeyer before the R. P. S., has been reprinted in *Anthony's Photographic Bulletin* (Dec., 1900, and Jan. issues). At the conclusion of the paper Mr. Dallmeyer presented a list of the scientific and semi-scientific applications of photography at the present date. This we republish here as a handy list for reference:

Scientific and semi-scientific applications of photography: Air streams, recording; Alloys, showing nature of; Animal movement, showing nature and phases; Anthropology; Anthropometry; Antiquities, coins, MS., etc., making records of; Astronomical research generally; Barometric observations; Bullets, registering flight of; Cardiac drugs, recording effects of; Circulation of blood of fœtus, showing; Clouds, determining height of; Composite portraiture, synthetic and analytic; Crystals, mode of formation; Drop, formation in splashing of; Elements, contributions to the knowledge of; Entomology; Explosives, action of; Geographical exploration; Gun barrels, recording vibration of; Invisible radiations, detecting; Invisible spectrum, exploring; Lightning, registering (in daytime especially); Liter, determination of the error of the; Map-making; Metals, to show the effect of strain on; Metals, to show the texture of; Meteorology, many applications to; Metrophotography; Micrometry, a means of; Micro-photography, applications to; Military, various applications; Motion, analysis of; Motion, reproducing effects in appearance of; Radiography in various applications; Refractive indices, determining; Retina, recording condition of; Solar and stellar physics, many applications; Sound, recalling effects of; Spectroscopy in spectrum analysis; Stomach, exploring interior of; Submarine surveying; Sunshine recording; Surveying or photogrammetry generally; Telegraphic messages, recording; Telegraphing designs; Telephotography; Temperature,

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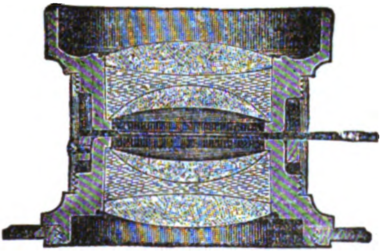

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recording; Vocal organs, showing condition of; Wood, showing internal structure of.

◆

We have to thank Mr. Clarence H. White for a copy of the catalogue of an exhibition of photographs held at the rooms of the Camera Club, Newark, Ohio, in December. The display consisted of some 250 prints contributed by local workers or by invitation, and seems to have been decidedly interesting. The catalogue is enriched with a signed photogravure of Mr. White's *Edge of the Woods—Evening* (a charming bit of work which we are glad to possess), and marginal notes concerning the exhibitors—the preparation of which must have been a somewhat delicate task.

It is a pleasure to note the increasing frequency of these exhibitions of pictorial photography throughout our country.

◆

Our exchanges are full of papers dealing with *backed plates* and their advantages. Various recipes for "backing mixtures" are given, and many schemes are being exploited for the expeditious and cleanly backing of plates. It may be worth while pointing out that The Photo-Miniature, No. 8: *Photography at Home* deals with the subject in a practical way on pages 377 and 378.

At the same time we must express the opinion that backing plates is at best a tedious and messy business *when one can obtain good plates already backed.* Moral: Use Lovell's Backed Plates.

◆

The World's Work (Doubleday, Page & Co.) is a new monthly magazine which photographers should not miss. The January number contains an article entitled "Going Back to the Soil," illustrated by Gertrude Käsebier in happy fashion, and another paper on "Park Making as a National Art," illustrated with photographs by Alfred Stieglitz, R. F. Turnbull, W. H. Rau and others.

Mr. Walter H. Page, the editor of *The World's Work*, is an enthusiastic believer in the possibilities of illustration by photography, for which reason we may look for much good photography in the pages of his magazine.

◆

Mr. E. J. Wall has retired from the editorship of the *Photographic News* (London) and will devote himself to laboratory work hereafter. The new editor of the *News*

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is Percy R. Salmon *alias* Richard Penlake, to whom our sympathies are extended.

❧

The British Journal Almanac for 1901, published in England in December, made its appearance on this side early in January. It is impossible to say anything new of the *B. J. Almanac* in the way of praise. The book is bigger than ever, consisting of 1,552 pages of text and advertisements. The articles deal with a rich variety of subjects, and the illustrations are numerous and well printed. A valuable digest of information concerning *Exposure Tables and Exposure Meters* by the editor, Mr. Thomas Bedding, occupies the place of honor and is worthy of its place.

We congratulate Mr. Bedding upon the happy conclusion of his labor in the making of the *Almanac* — all the copies of which were sold three weeks after publication. American readers can, of course, still obtain copies from the American agent, Mr. G. Gennert, N. Y. 50 cents; postage, 20 cts.

❧

Contributions to Photographic Optics. By Otto Lummer, Ph.D., Berlin. Translated and augmented by Silvanus P. Thompson. 135 pp., with numerous diagrams. 6 x 9 x ¾ in. Net, $2.00. The Macmillan Company, New York. [Obtainable from Tennant and Ward.]

Mr. Thompson deserves the thanks of all interested in the optics of photography for making Lummer's admirable papers accessible to English readers. The book gives one a clear and definite exposition of the characteristics of photographic objectives from the strictly scientific rather than from the popular point of view. This does not mean that it is "dry reading," but it is a book which requires careful reading. This requirement met, the reader will find in its pages a vast store of useful information hardly obtainable elsewhere, ranging from the pinhole to the modern anastigmat. A fairly good idea of the scope of the volume may be had from the following summary of its contents: *Chapters:* (I) The Attainment of a Perfectly Sharp Image; (II) Seidel's Theory of the Five Aberrations of Sphericity; (III) Formation of Images by Means of a Small Aperture—Pinhole Camera; (IV) Formation of the Image by a Simple Converging Lens; (V) Influence of the Position of the Stop upon the Flatness of the Field; (VI) The Cause of Distortion—Conditions Necessary for Images without Distortion; (VII) Systems Corrected for

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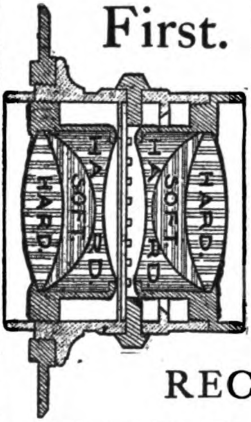

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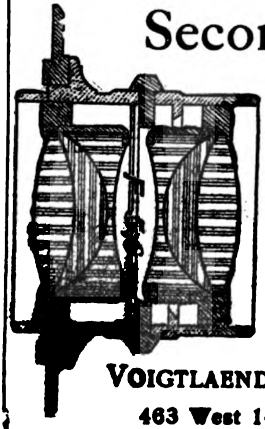

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❧

The Actien Gesellschaft fur Anilin Fabrikation, of Berlin, send to our table a copy of the revised edition of their pamphlet on *Patented Developers*. This pamphlet, which contains much carefully prepared information on modern developing agents, intensifiers and reducers, may be obtained gratis from George Murphy, 57 East 9th st., New York, or E. & H. T. Anthony & Co., 124 Fifth ave., New York.

❧

A valuable monograph on *Light Filters* (color screens), by Dr. Grebe, of Jena, is given in the *British Journal of Photography*, December 28 and January 4. This is perhaps the most comprehensive of recent papers on the subject and is worthy of filing for reference.

❧

Apochromatic Collinear Lenses.—Messrs. Voigtlander and Sohn, of Brunswick, announce the issue of a new series of apochromatic collinear lenses. It is stated that the glasses used in the lenses have been selected so that the secondary spectrum is completely corrected, consequently the three images for blue, green and red fall on the same plane and are the same size. By this apochromatic correction the sharpness of the definition has been increased, and is more even over the whole image than with an ordinary objective of the same aperture.

❧

The Gray-Lloyd Mfg. Co., Ridgewood, N. J., have issued a neat folder describing their *Double Stigmat* in detail. This new lens is one which is bound to enjoy considerable popularity when its remarkable capacities become known, and the descriptive circular indicates some of these possibilities in a plain and straightforward way. As soon as time permits we hope to give the *Double Stigmat* a practical test and report on its performance.

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◆

The editors of the *Photogram* send for our book-shelf the bound volume of that admirable journal for 1900. We now have a goodly row of *Photograms*, and find them invaluable books of reference because of the vast amount of technical and trade information compressed into their ample pages. The new volume is in every way an improvement on its predecessors, and the illustrations are decidedly better than in previous years. Always excepting the *British Journal*, it may be justly said that *The Photogram* offers at once the most concise and most complete record extant of photography in Great Britain. [Spon & Chamberlain, American agents, New York.]

◆

If there is one branch of outdoor work more than another wherein the amateur is likely to fail, it is in attempting to secure the delightful effects gotten by photographing against the light. Proof of this is seen wherever a collection of amateurs' prints may be looked over, as at a club exhibition. Writing on the subject in the *News*, Mr. William Thomas gives the subjoined counsel touching the technical difficulties involved. We quote:

Everybody knows that if we allow a ray of direct sunlight to fall upon our lens when taking a view, in ninety-nine cases out of a hundred we shall get a circular spot of light on the ground glass, which opticians call a "flare-spot." We may further notice, when working towards the source of light, even when the sun does not actually shine directly into the lens, that the picture on the ground glass looks hazy and misty, owing to the large amount of light admitted which is not actually forming the image, and which would have a fogging action on the plate.

Both of these defects we must take steps to avoid. A ray of direct sunlight may often be prevented from entering the lens by so locating the camera as to allow some intervening object—i.e., the branch or trunk of a tree—to cast its shadow upon the lens, and so prevent direct rays from entering. It is absolutely necessary to take this precaution when the sun's rays are powerful and the orb is high in the heavens, but when near the horizon, and under certain atmospheric conditions—i.e., in misty or

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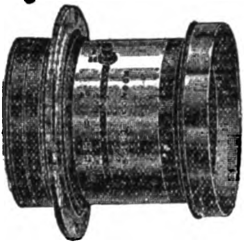

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4	7½	5 x 4	6½ x 4¾	7½ x 5	37
5	9	6½ x 4¾	7½ x 5	8½ x 6½	45
6	11	7½ x 5	8½ x 6½	9 x 7	60
7	13	8½ x 6½	9 x 7	10 x 8	77
8	15	10 x 8	12 x 10	13 x 11	102
9	18	12 x 10	13 x 11	15 x 12	135
10	21	13 x 11	15 x 12	18 x 16	180
11	24	15 x 12	18 x 16	22 x 18	232

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foggy weather—it is often possible to obtain very delightful atmospheric effects by including the actual sun's image on the plate. In such cases the image must be carefully examined on the focusing screen before exposing the plate, in order to see whether there are any ghostly or reflected secondary images, or that too much fog is not present.

The second danger to which we have referred—namely, the degradation or fogging of the image caused by the admission of a large volume of rays which do not go to form the image, may in all cases be cured by shielding the lens with a hood, and by that means preventing them from falling upon and passing through it to the plate. For this purpose a large flap shutter is perhaps the most generally useful contrivance that can be employed, although in an emergency the hat, the lens cap, an umbrella, or even the hand, may be used. With these latter, however, there is always a danger of the extemporized screen cutting off a portion of the picture, a fact which will not become apparent until developing the plate. An adjustable flap shutter, however, may be lowered or raised until the lens is completely screened from direct light, and yet without cutting off any portion of the field. It will be instructive to note the very different appearance of the image with and without the screen, for by its aid the most beautiful effects of light and shade, which could not otherwise be attempted, may be secured.

Those who are not accustomed to working under these conditions, and who have confined themselves to more orthodox systems of lighting, often make the mistake of giving insufficient exposure. When working against the light it is all-important to bear in mind and follow the oft-repeated rule—"expose for the shadows," and in doing so it must be remembered that those same shadows under such conditions are very deep and require plenty of time. Overexposure of the high lights need not, as a rule, be feared; the tendency in such cases, where the contrast between light and shade is great, is to exaggerate rather than to minimize, and a generous exposure will assist in subduing any tendency to over-accentuate the high lights, and at the same time give the shadows a chance of properly recording themselves on the plate. As a rough guide, I may state that an exposure in brilliant spring sunlight of 15 seconds, with a lens aperture of *f*/11, will prove to be about correct—in short, the rule should be to over- rather than under-expose.

There only remains one other point to be observed in photographing under such conditions, that being always

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to use a backed plate. There will, of course, be a tendency to halation where a strong light comes in immediate juxtaposition to a dark shadow. To a certain extent, however, the blurring so caused is perfectly natural, and it is quite correct to reproduce it; but, unfortunately, in the photographic process the natural effect is often exaggerated, and for this reason and to prevent this happening it is desirable to back the plate. Personally, I prefer isochromatic plates for work of this class, and I recommend their employment in conjunction with a pale yellow screen.

If he will bear in mind all these technical considerations, the photographer who cares to ignore stereotyped rules may, if he possess the necessary artistic ability, succeed in producing some very delightful and unconventional work.

◆

The very practical and useful camera stand for photographing flowers, specimens and general copying purposes, first described by its originator, Mr. J. Horace McFarland, in THE PHOTO-MINIATURE, No. 13: *Photographing Flowers and Trees*, has been widely appreciated. During the past few weeks it has appeared in the *Botanical Gazette*, Chicago; the *American Journal of Microscopy*, Rochester; and an English photographic periodical.

◆

We are not given to "blowing our own horn" in these pages, and have strenuously avoided the tendency to self-praise or extravagant claims which disfigure so many of our otherwise intelligent contemporaries on both sides of the Atlantic. But we cannot forbear a word of public acknowledgment of the many letters received daily in which the usefulness of THE PHOTO-MINIATURE is commended in a very generous way. It is, of course, a great pleasure to see this appreciation of the work put into the making of the magazine month by month, and our hearty thanks go out to all those who have paused for a moment to send us the encouragement of their good will.

◆

Lehrbuch der Pratischen Photographie. By Dr. A. Miethe. Part I. 30 cents. Wilhelm Knapp. Halle a/S, Germany.

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through a large edition in Europe. The new and revised edition, above mentioned, is to be issued in monthly parts, of which this is the first. Dr. Miethe deals with the practical, rather than the theoretical, side of photography, and the book is characteristically clear and concise in its handling of the subjects dealt with.

◆

The California Camera Co. sends greetings for the new year in the form of a remarkably fine print, 11 x 14 ins., on the *New Century Polychrome Paper*, reproducing the effect of a photogravure reproduction from a painting. *Polychrome* is a Californian product, simple in its manipulation and yielding very desirable results. We are glad to hear that it has found such favor among western amateurs that the manufacturers have been obliged to enlarge their facilities for its preparation.

◆

A writer in the *Amateur Photographer*, dealing with the focusing of dark interiors, says:

The image on the ground glass with even a moderately small stop is often very difficult to see at all distinctly. In that case the following hint is worth remembering. Having arranged your picture, first measure the distance of your camera to the nearest object that you wish to get in focus. Let us suppose the nearest object to be eight feet away. Then measure the distance of the most distant point to the lens. Suppose this to be forty feet. Now multiply these two distances (eight and forty feet) together, double the result, and divide this by the sum of the two distances. Thus, 8 multiplied by 40, and again by 2, is our numerator, while 8 plus 40 is our denominator, i. e.,

$$\frac{8\times40\times2}{8+40}=13\tfrac{1}{3}.$$

We now select some easily seen object thirteen or fourteen feet away. Focus on this with the largest stop. Then insert a stop small enough to give the required degree of sharpness to either the nearest or most distant object. For we now know that these two points will be equally sharp, whatever that degree may be.

It is worth while noting that we can, if we prefer, take our camera outside the building and focus on a point thirteen and a half feet away, and then select a stop sharp enough to give us an eight feet distance object as sharp as required. The camera can then be taken into the

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building and the view arranged without any further alteration of focus or stop.

It is also worth remembering that if we are using a square body camera, i. e., one with a front the same size as the back (i. e., not a taper bellows), if we look along either of the top edges of the camera the point we see is the one which comes on the middle of the plate. And if we put the eye just over the middle of the back, and look at the right and left corners of the top of the camera front we shall see the sides of our picture.

Another useful tip is this: Remove the lens, swing the camera round, remove the ground glass, place the eye to the lens opening, and you will get a very fair guide as to how much of your subject is included. Having noted this, and what object comes in the center of your plate, you can adjust this by looking along either top edge as has just been mentioned.

◆

Wilson's Photographic Magazine for January appears in a dress of new type, and is printed on a clearer, whiter paper than heretofore, with corresponding advantage to the reader. The illustrations include several capital studies in posing and lighting the figure by Henry H. Pierce, Schloss, C. A. Zimmerman, and others; and among the articles may be found one on *Ozotype*, and another on *Plain Paper*, containing many useful hints for amateurs. [Edward L. Wilson, New York. Price 30 cents].

◆

The second shipment of *Photograms of the Year 1900* has arrived, and copies may again be had in paper or cloth binding. The demand for this book has been unusually large, both here and in England, and it is not unlikely that it will speedily be out of print and unobtainable.

The shipment of *Penrose's Process Year Book*, announced in a previous issue, has also largely disappeared. As no more copies of this work can be obtained from England, those who have not yet secured a copy will do well to secure it promptly to avoid disappointment.

◆

Messrs. Ross, Ltd., 111 New Bond St., London, send us copies of their most recent circulars and price lists. These describe the Ross-Zeiss *Unar* Lenses, the latest production of Zeiss, and the complete series of photo-

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graphic objectives manufactured by them. We have a few spare copies of these announcements which are at the service of those interested.

◆

Among the New Year's greetings which came to our table one of the most charming was a copy of the *Hiawatha Calendar*, published by the Taber-Prang Art Co., from the sketches in color and designs of Mr. C. A. Zimmerman, of St. Paul. Mr. Zimmerman has a long and enviable reputation as a portraitist, but his skill with the brush is fully equal to his cleverness in photography. The *Calendar*, which has also been modified to form a *frieze* decoration without the calendar feature, brings before one in vivid fashion the scenes and incidents recorded by Longfellow, and provides a tasteful bit of color for the walls of the home.

We are not surprised to hear that Mr. Zimmerman's work prepared for publication has met with so much success that he proposes to locate in or near New York at an early date.

◆

Down South pictures, by Rudolph Eickemeyer, Jr., with a preface by Joel Chandler Harris. 9½ x 14½ in. Price, $1.50.

In and Out of the Nursery. Verses and songs by Eva Eickemeyer Rowland, pictured by Rudolph Eickemeyer, Jr. 9½ x 14½ in. Price, $1.50. Published by R. H. Russell, New York.

These two books are of interest here because they admirably display the use of photography in the illustration of books. They are interesting also as offering in dainty shape some of Mr. Eickemeyer's best and most recent work. Not all of the pictures are worthy of praise, nor do they always meet one's notion of this or that, but as suggestions for the amateur seeking inspiration they are altogether acceptable. They are printed on heavy plate paper, with a photogravure design, and the half-tones are cleverly managed—which applies to all the Russell publications we have seen.

◆

Nipher's Zerophotography.—An enthusiast writes:—"Professor ——— tells me of the wonderful discovery that has set the photographic world agog—how an over-exposed plate may be developed in suffused light, e. g.,

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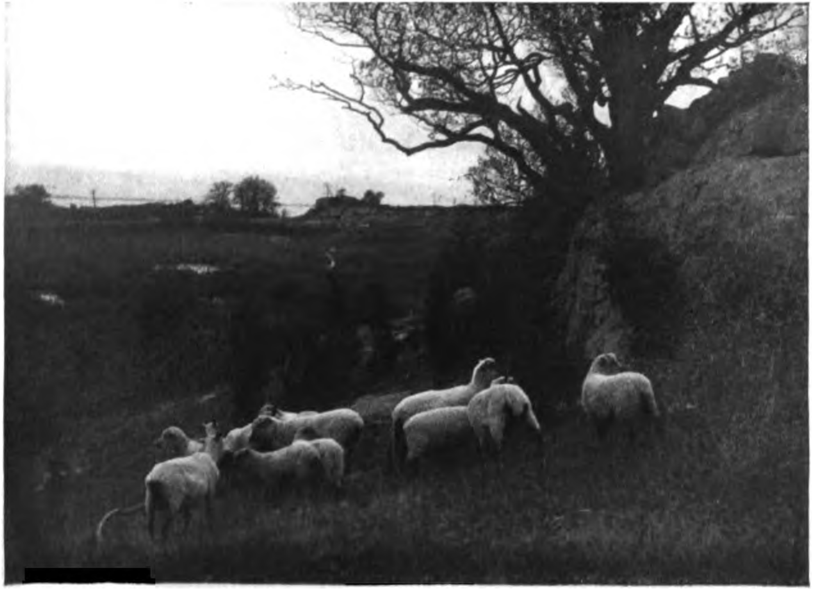
twilight, and give a good positive. Great, isn't it! And what an immense impetus it will give! Professor ——— tried it the first thing after he got home, and it works!" Whereupon the Practical Man "tried it" and writes:—"The results are remarkable. As soon as we have a light day I propose to try it on fruits, and make a series of careful experiments, working a dozen plates on the same subject, with various exposures and methods of development. I have already proved to my satisfaction that it is easy and convenient to make a duplicate negative of a negative by artificial light, with development in the full light. It is a marvelous thing. You should have a note about it in THE PHOTO-MINIATURE."

All this refers to Nipher's *Zerophotography*, which the reader can find outlined in the November, December and January issues of the *Photo Era* (Boston). The accounts given cannot be condensed into the space here at our disposal, and the experiments are sufficiently interesting to justify the expense required to read the original text in the *Photo Era*.

The editor of *Photography*, commenting on the matter, confesses that he is "in the dark" as to the method of usefully employing the discovery, which, as we have pointed out, seems to be nothing but our old friend reversal."

(*To be continued.*)



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LISTENING
George E. Tingley

THE PHOTO-MINIATURE

A Magazine of Photographic Information

EDITED BY JOHN A. TENNANT

Vol. II FEBRUARY, 1901 No. 23

PHOTOGRAPHIC MANIPULATIONS.

After the excitements of the first year with the camera have subsided, the amateur—unless he forsake photography altogether—usually takes up its practice in a serious or more intelligent way than formerly. The blandishments of the man who "does the rest," of ready-to-use mixtures, and other short cuts to perfection cease to attract, and the novice sets himself with sober enthusiasm to the study of photographic manipulation. Next to personal experience the worker at this stage naturally seeks to know the experiences of others in the same field, and so our novice comes to the reading of photographic books. Here, too often, vast disappointments await him. The books gloss over so much, and leave so many things unsaid; the printed page brings up so many questions to which it gives no satisfactory answer. Sometimes the maker of a text-book demands of his readers at least as full a knowledge of his subject as he himself possesses. I know of several books of this sort.

It is an old difficulty. As far back as I can remember, complaint has been made that the makers of photographic text-books take too much for granted, i. e., do not sufficiently keep in mind the fact that the average reader is not familiar with the thousand and one terms and references left unexplained as "things generally known." In THE PHOTO-MINIATURE, as far as possible within practical limits, this difficulty has been recognized and overcome, apparently with a certain measure of success. And yet an expert worker recently protested against a mention of "anhydrous soda" in these pages without explanation of the term. Still another reader was disappointed, because he read herein that "the latent image is invisible" without explanation as to *why* it is invisible. From which it appears that it is an exceedingly difficult thing to make a book which will bring information unto every one according to his need.

In this number of THE PHOTO-MINIATURE an attempt has been made to offset the deficiencies of the text-books as set forth, and to provide photographers with a handy book of reference concerning the little things generally overlooked by photographic writers. The arrangement of the text follows the natural order of photographic manipulations: viz., Chemicals; Weights and Measures in general; Weighing and Measuring by various systems: Making Solutions; Keeping and Measuring Solutions in Practice; Using Solutions; Washing and Drying Plates and Prints. The monograph is from the pen of George E. Brown, a practical photographer, thoroughly trained in laboratory methods. Personally, I like his clear and direct way of getting at the root of a difficulty, as, for instance, in his exposition of the metric system, its advantages and use. Unless I am mistaken, the information Mr. Brown puts before us in simple and plain language herein will clear away many difficulties long complained of by American and English readers of photographic literature.

EDITOR.

Facts to Know About Chemicals. The chief things one wants to know about the chemicals used in photography are not their formulæ or atomic weights, but their practical qualities, i. e., their solubility, keeping properties, the differences in name and fact between commercial varieties, and such facts as the impurities likely to be found in the chemicals we buy at the stores, how far these impurities are harmful, and how they can be minimized or removed.

Solubility. As a rule, chemicals are more readily soluble in hot than in cold water, so that if more than the quantity soluble in cold water is dissolved by the aid of heat, the excess of the salt will separate when the solution is cooled.* Such a solution is said to be "saturated" in the cold, and for a given temperature contains always a certain definite quantity of salt. Generally 60° Fahr. (15.5° C.) is the temperature which is presumed when talking about cold saturated solutions. There are two ways of expressing solubility. We can say how much of the solid is contained in a given volume of saturated solution; or we can say how much of the solid is required to saturate a given volume of water; other things being equal, the latter is always rather more than the former.

---

* That is, usually. It is possible to make a cold super-saturated solution by cooling a hot strong solution very quietly and protected from dust. Let the reader try the experiment of dissolving an ounce of hypo in half an ounce of water by heat, taking care to dissolve every particle, and cooling in a test tube closed with a bulb. The liquid will remain clear, but on dropping in a single fragment of hypo will become almost solid.

The practical thing to remember about solubility and making solutions is, that if left to themselves at the bottom of a bottle most chemicals do *not* forthwith form a saturated solution. This point is gone into more fully in the section on making solutions. Note here that as chemicals generally dissolve more freely in hot water than in cold, the straight way to get a saturated solution is to take more of the salt than is necessary (see figures later), dissolve and cool. There should be a deposit at the bottom of the vessel if all is well.

Chemicals Which Spoil. Many chemicals do not keep indefinitely. Their failing in this respect is mentioned seriatim below. As a general rule, all chemicals should be kept tightly stoppered and in the dark. In particular are developers (pyro, etc.), sulphites, sulpho-cyanides, ferrous and ferric salts (the former oxidize in the air, some of the latter reduce on exposure to light), silver, gold and platinum salts (get "reduced" in the light). Among others which spoil by absorbing moisture from the air, and which must, therefore, be tightly stoppered are ammonium and potassium sulpho-cyanides, uranium nitrate and chloride, calcium chloride, bleaching powder, ferric chloride (iron perchloride), potassium carbonate, caustic potash, potassium cyanide, caustic soda and sodium sulphite.

Sulphites. The larger the proportion of sulphurous acid the better the preservative action of sulphite. This is all the difference between the various sulphite substances, except that some are acid. (See later.)

Sulphurous acid is sometimes given in development formulæ. This is a solution of the gas SO_2 in water. The saturated solution has a specific gravity of 1.046 and contains 9.5 parts of the real acid per 100 parts of the liquid.

Sodium sulphite is sold as "crystallized" and "anhydrous." The second has no water of crystallization. One part of it equals two parts of the former. Soda sulphite (crystallized) should be clear and white, not coated with white powdery deposit. The latter contains sulphate and spoils the sulphite for many purposes, as, for example, making metol and other developers. To use such sulphite, rinse it with a very little water and dry between blotting paper before weighing out. Some sulphite turns red litmus paper blue, showing that it is alkaline. This is generally due to the presence of sodium carbonate. This is an evil where the sulphite is being used to mix with pyro, since the alkali favors the pyro turning dark in color. Remedy: Add a little citric acid until the solution (before addition of pyro) turns blue litmus paper red.

Potassium Metabisulphite. This salt contains nearly twice as much sulphurous acid as crystallized soda sulphite, but is acid insomuch that for every grain of it used in making up a developer the alkali in the developer must be increased as follows:

Ammonia, .45 grain; caustic potash, .50 grain; caustic soda, .36 grain; potassium carbonate (dry), .62 grain; sodium carbonate (dry), .48 grain; sodium carbonate cryst, .96 grain. The solubility of the salt in cold water is 33 per cent.

Alkalies. The caustic alkalies (caustic soda and caustic potash) are more powerful than the carbonated alkalies (sodium carbonate, etc.). The former cannot be used with many developers, though where they can they give a more rapid solution.

Caustic soda is sold as "pure stick," "by alcohol" and "from sodium." The first, if of good quality, is pure enough for photographic use. The second is purer, but higher in price. The third (chemically pure) is too expensive for consideration. All kinds must be kept tightly stoppered in bottles, with the stoppers greased with vaseline to prevent their sticking. Exposed to the air, caustic soda gets crusted over with a white opaque coating of carbonate, which ought to be removed by scraping before weighing. Beware of particles of caustic soda flying on to the clothes, in which a hole will speedily be eaten. Note also that the readiness with which soda dissolves in water may lead the inexperienced to forget to mix thoroughly by shaking. If this is not done the heavy alkaline solution may remain at the bottom.

Caustic potash is similar to caustic soda, except that it is much more soluble. Both alkalies are best dissolved in distilled water.

Ammonia is a strong solution of the gas NH_3 and contains about 33 per cent (by weight) of it. It soon loses strength, and it is best to mix it with an equal volume of water as soon as purchased and use accordingly.

Carbonated Alkalies. *Sodium carbonate* is purchasable as "cryst" and "anhydrous," or "dry." The latter contains nearly three times as much real carbonate as the former. Sal soda (the washing soda of the stores) is a fairly good variety of soda, but it is best to use the pure crystals especially supplied for photographic use. Example: Seed's new *Carbonate Soda* C. P.

Dry sodium carbonate is a very convenient salt for taking on tour, for in addition to its greater concentration it dissolves very easily. It is to be noted that the so-called "carbonate of soda" of the grocer is usually bi-carbonate of soda and of no use for development. Solubility (cryst) 50 per cent.

Potassium carbonate is also purchasable as crystallized and dry. The former is of rather variable quality. Andresen's, according to an analysis made by the writer in 1895, contains 85 per cent of real (dry) potassium carbonate. Potassium carbonate is very soluble indeed,—100 parts of water will dissolve 109 parts of the salt. It must be kept well stoppered to prevent absorption of water, which, without this precaution, goes on so rapidly as to liquify the salt.

Acids. *Acetic acid.* The strongest variety is known as "glacial." This is the kind which is usually meant in formulæ. If allowed to remain on the skin for any length of time, it produces a blister. It mixes with water in all proportions.

Hydrochloric acid ("muriatic acid," spirits of salt). The pure acid is a colorless fuming liquid which corrodes the skin and clothes, and is an irritant poison. Spirits of salt is an impure and weaker variety. The pure acid must be used for the clearing bath in platinum printing.

Hydrofluoric acid is a similarly corrosive liquid which attacks glass and is therefore kept in gutta-percha bottles.

Nitric acid. The pure acid has a specific gravity of 1.22, and ought to be colorless. Beware of the acid on fingers and clothes. Remedy any accident by ammonia followed by cold water at once.

Oxalic acid. This is poisonous, and its solubility is 12 per cent in cold water.

Bromides. In the pyro-ammonia developer ammonium or potassium bromide may be used indiscriminately, but in almost all other cases it is necessary to use potassium bromide because strong alkalies will always liberate ammonia from ammonium bromide.

Gold Chloride. This ought to be kept in solution, as the small quantities usually required cannot be weighed out. One grain per ounce of water is convenient. The water must be distilled. Some pure waters will do, but others cause the metallic gold to separate. The safe rule is to use distilled water, and keep the solution in the dark.

Potassium Chloroplatinite. Use distilled water here also. Sometimes it may be difficult to make an entirely clear solution. A drop or two of hydrochloric acid will put this matter right and does not unfit the solution for toning.

Potassium Ferricyanide. This ought to be blood-red crystals (the yellow ferrocyanide is a different substance and of little direct use in photography) free from yellow incrustration. Before using any which is not quite clear from this defect, rinse with a little water. Keep the salt, both solid and solution, in the dark. Solubility, 40 per cent in cold water.

Potassium Oxalate. This ought to be neutral—i.e., neither acid to blue litmus nor alkaline to red litmus. When dissolved in ordinary tap-water (hard water) a milkiness is produced which does no harm if the solution be left to clear by standing a while, and then decanted to get rid of the sediment at the bottom of the bottle.

Hypo. The small white crystals which dissolve in water to a bright solution are the most preferable form. Impure hypo often makes a turbid solution. It is best always to use hypo alkaline by adding ammonia or carbonate of soda. Acid toning or fixing baths are risky because acids decompose hypo and liberate sulphuretted hydrogen. This substance produces a black precipitate with silver in various forms and stains of divers kinds are due to this action. Sulphurous acid is one acid which does not decompose hypo, but it rapidly oxidizes to sulphuric acid, so that a mixture of hypo and sulphurous acid is not as safe a mixture as one might suppose. But by keeping an excess of sulphite of soda along with the hypo the action of an acid is mitigated, sulphurous acid being given off from the sulphite and the acid being taken into combination. Therefore a mixture of hyposulphite and citric or sulphuric acid is an acid-fixing bath to which there is little objection. Acid fixing baths, however, do not fix quite so quickly as alkaline baths.

Other Chemicals.—The reader wishing to make himself familiar with the properties of chemicals other than those in common use mentioned above should consult *Chemistry for Photographers*, by Chas. F. Townsend, or the article on "Chemicals," by E. J. Wall in *The Year Book of Photography* for 1898.

Water. The purity of water is a thing to be hoped for, or when conspicuous by its absence made the best of. Impurities are mainly (1) dissolved air, (2) lime (chalk) and other mineral salts, (3) animal or vegetable matter. (1) and (2) are almost entirely removed by boiling the water and letting it cool quickly. This always benefits a water for all photographic purposes, for dissolved air causes air bells on plates, promotes the oxidation of developers, and acts prejudicially on many solutions. Moral, boil and cool your water before using. Water which contains animal or vegetable matter is often (but not invariably) turbid. The impurity is chiefly detrimental to gold and platinum solutions, toning baths and other solutions containing precious metals. There is no ready remedy. Use distilled or pure spring water. Lime salts cause milkiness of oxalate, phosphate and other solutions, but are not objectionable, even on this score, if the liquids are filtered (see elsewhere).

Weighing and Measuring. Every dark-room ought to have two balances—one for weighing small quantities up to, say, a quarter of an ounce, and another from this latter quantity up to a pound or so. The first is for chemicals required in small amounts, but with approximate exactness; the second for substances such as hypo or potassium oxalate, which need not be weighed with special accuracy. For the former, the ordinary beam balance of the dealers, preferably with glass pans, is the best, for the latter a spring balance with a good-sized pan, 6 inches or more in diameter and detachable from its setting. To those who care to go to the expense, the most convenient plan of any is to combine these two scales in one and to use a Beranger balance (Fig. 1). An instrument of this pattern carrying two pounds is delicate enough for the smaller quantities a photographer requires, but it is expensive. When very small quantities of chemicals have to be weighed out it is best to make instead a stock solution (10 per cent or 1 per cent), and to measure of this the quantity required to give the weight of salt. Thus, instead of weighing 2 grains of sodium sulphite (for a toning bath) I would dissolve 44 grains in 10 ounces

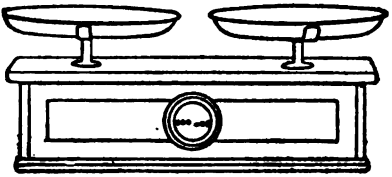


Fig. 1.

of water (i. e., make a 1 per cent solution) and use 200 minims.

It is of the utmost importance to keep the pans of the balance scrupulously clean. That is why glass is best; practically no chemical attacks it. But there is no need to place the salt on the bare pan. In fact, this should never be done. Cut out circular discs of paper and keep a stock handy, placing one on each pan. Or a better way is to get a little aluminum bowl or dish which will stand on the pan and to cut a counterpoise for it out of sheet lead. It is quite easy to clean a separate vessel, but not so in the case of the pans.

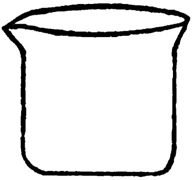


Fig. 2.

When liquids have to be weighed a glass vessel must be counterpoised. The best for the purpose is the beaker (of the analytical chemist) of the low and wide type (see Fig. 2). It is very light, stands steadily on the pan and pours cleanly; but it must be most carefully handled, for it is very thin and broken at once if squeezed or set down hurriedly on a hard place.

Generally it is most convenient to measure liquids rather than weigh them—a question which makes it necessary to say a word on a point which is perhaps not always clear.

Specific Gravity.

Some liquids are heavier than water; some lighter. The term "specific gravity" expresses the weight of a given volume of the liquid compared with the weight of the same volume of water. Thus, sulphuric acid is 1.8 times heavier than water, i. e., its specific gravity (sp. gr.) is 1.8. The reason for explaining this about sp. gr. is that when we know the sp. gr. of a liquid we can calculate in two ways: (1) We can find what volume we must measure to give a given weight, and (2) what weight we must weigh out to give a given volume. Generally the first is the thing we want to do, so I place the rule to be remembered like this: Weight÷sp. gr.= volume. This means that if we want to find how many cc.'s of a liquid we must measure out instead of weighing so many grammes, we must divide the grammes by the sp. gr. Thus 50 grammes of strong ammonia (.880) is the same thing as 56¾ cc.'s; or 100 grammes of sulphuric

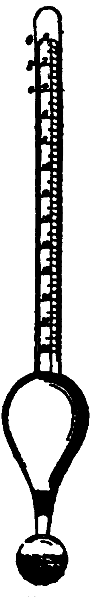
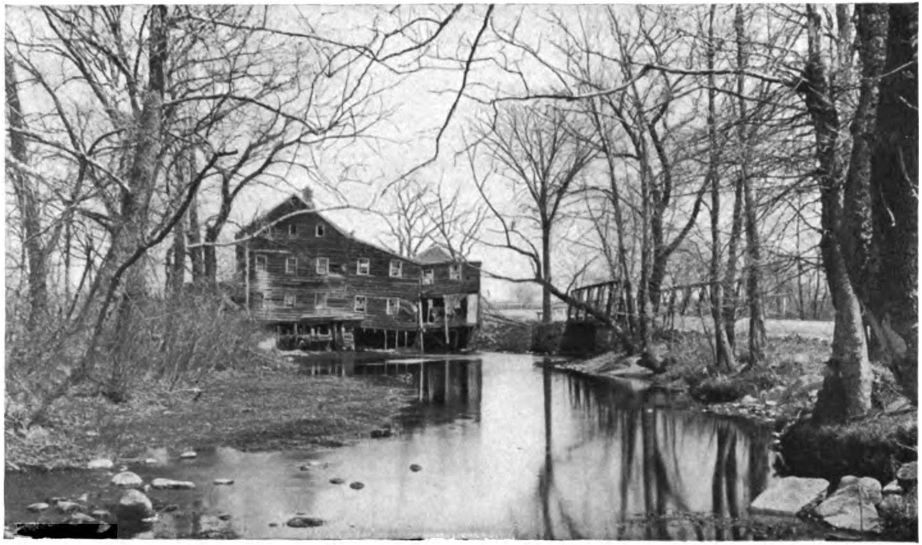
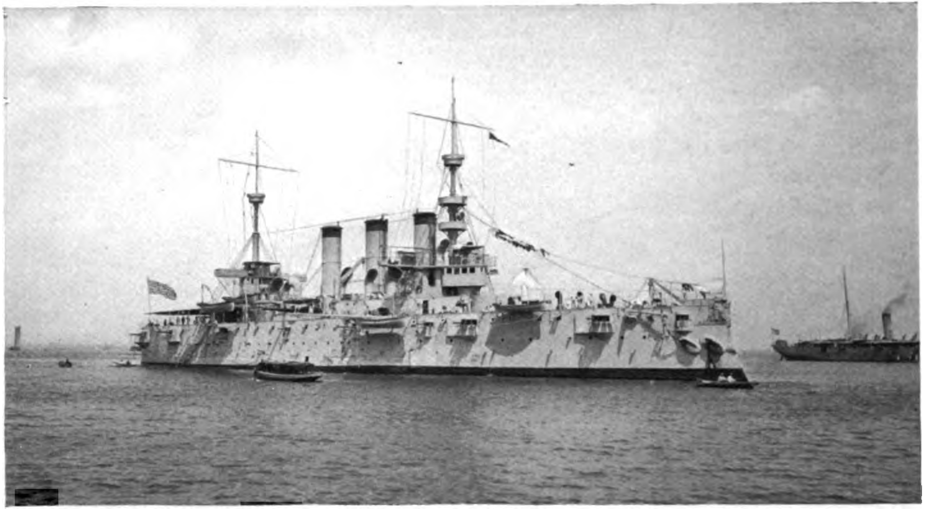


Fig. 3.



Alb. 4½ x 7¾ in.

A DESERTED MILL
Vernon Royle



Alb. 4¾ x 7¾ in.

SAMPSON'S FLAGSHIP U. S. S. NEW YORK

At anchor off Tompkinsville, N. Y., after Santiago

Vernon Royle

acid is the same as 54 cc.'s. I have advisedly used grammes and cc.'s here because this rule can only be given in this simple way when the weight of the unit volume (cc.) of water exactly equals the unit weight (1 gramme). This is not the case with some of the imperial fluid and solid measures.

The specific gravities of liquids alter with temperature, but the differences within ordinary limits—50°–70° F.—may be neglected for photographic purpose.

The following table gives the specific gravities of commonly used liquids: Acetic acid (glacial), 1.0553; hydrochloric acid, 1.16; nitric acid, 1.42; phosphoric acid, syrupy (90 per cent), 1.7; phosphoric acid (50 per cent sol.) 1.3; sulphuric acid, 1.84; acetone, .814; alcohol (absolute), .794; alcohol (rect. spirits), .838; ether (sulphuric pure), .722; glycerine, 1.23.

Below is given a list of gravities of solutions of known strengths of various chemicals, which will be useful because the worker can make his solutions up without weighing or measuring.

The Hydrometer. The hydrometer enables him to do this by telling him the specific gravity of any solution. Hence when the hydrometer (Fig. 3) says that the specific gravity of a solution of sodium carbonate (sal soda) is 1.246 one knows that the liter of solution contains 311 grammes or the gallon (U. S.) 41.5 ounces. Hydrometers are graduated in specific gravity units, say, .500 to 1.000, but they are also marked on the Twaddell & Baume scales. The latter only, much used in America, need concern us here. The former is only used (in England) in chemical works. There is no safe rule for converting specific gravity proper into the Baume figure, but tabulated equivalents, calculated from experiments by Professor C. F. Chandler, of New York, will be found in most good chemical text-books.

Table of Specific Gravities

Saturated Solutions	Specific Gravities	Per cent of Salt by Weight
Ammonia alum	1.048	11
Potassium carbonate, dry	1.571	52
Potassium oxalate	1.262	25
Sodium carbonate (cryst.)	1.199	49
Sodium hyposulphite (cryst.)		58
Sodium sulphite	1·197	35
Potassium carbonate (dry) 10.9 % weight per volume	1. 09	
Sodium carbonate (cryst.) 10.4% weight per volume	1.039	

Measuring Solids. Provided that chemicals are obtainable of fair uniformity in size of crystals or lumps it is quite accurate enough to measure instead of weigh them. It is very convenient to keep one or two glasses graduated to measure the weight of hypo or sulphite which one requires for a fixing or developing solution. Ordinary tumblers do very well. For smaller quantities of chemicals, test-tubes or ungraduated cylinders (from dealers in chemical apparatus) are needed. A little trouble expended on providing these measures saves a good deal of time afterwards. There is only one thing to look out after; viz., variation in the coarseness of the chemicals, which will upset the usually quite sufficient accuracy of this method.

Weights and Measures. Whatever system of weights and measures is used it is, at least, very desirable that the formula as given can mean only one thing. Many published formulæ are so worded that no man can say what are the actual proportions of the various chemicals. Drops, drams, ounces, measures by volume and weight all mingle in the pet formulæ which people publish, and I could even point out an instance where a prominent American photographer gave directions for the addition of 15 drops of a certain No. 1 solution to 100 *parts* (!) of No. 2. It would be easy to advise many reforms, but it is wisest here to get to present-day difficulties.

"Parts." *What is a part?* This is a question which many seem unable to answer. A formula given in "parts" simply means that you may take of each constituent weights (or, if so stated, volumes) *in the proportions* named. You may take grains, or ounces, or grammes, but so long as you keep to the same all through you will be right. Formulæ in parts become a little uncertain when liquids lighter or heavier than water enter into them. Where such formulæ occur in a book by a scientific man I feel safe in assuming that when he says, let us suppose, "sulphuric acid, 8 parts," in conjunction with, say, sodium sulphite, 20 parts, he means the acid to be weighed and not measured (or, if measured, allowance made for the specific gravity of the acid), but I am afraid photographic writers, as a rule, fail to inspire this confidence.

Percentage Solutions. A percentage solution means, of course, one containing so many parts per hundred. Strictly speaking, every solution is this, because the proportion of dissolved contents can be thus expressed, but the term is conventionally held to apply to solutions of certain even strengths, such as 5, 10, 20 and 50 per cent, which lend themselves to ready calculation.

There are two ways of expressing strengths of solution in percentages: (1) Weight of salt per hundred parts (by weight) of solution, the same units of weight being used in each case. Thus, 100 grammes of sodium sulphite solution (sp. gr. 1.197) contain 35.1 grammes of sodium sulphite (35.1 per cent by weight). (2) Weight of salt per hundred parts by volume of solvent, the units of weight and volume being thus related: The unit of weight (ounce, gramme) is the weight of a unit volume (fluid ounce, cc.) of water. In other words, the fluid ounce weighs one ounce and the cubic centimeter one gramme. To pursue the foregoing example, 100 cc.'s of sodium sulphite solution (sp. gr. 1.197) contain 42 grammes of sodium sulphite (42 per cent weight per volume).

The first method is never used in photography except in industrial technics. The second is not a scientific method except under certain conditions. These are that the relations between the subdivisions of the unit of weight and unit of volume must be simple. Advisedly these subdivisions must be the same. An example will show how error may creep in. Suppose we dissolve an ounce (avoirdupois) of any solid in water and make the solution up to 10 ounces of water. Is that a 10 per cent solution? In other words, do ten parts (volumes) contain 1 part weight? They do and they don't. Obviously 10 fluid ounces contain one ounce, but 10 minims would not contain 1 grain because the ounce avoirdupois contains 437.5 grains, whilst the fluid ounce contains 480 minims. Therefore 10 minims contain 437.5 ÷ 480, or .91 of a grain. As these stock solutions are generally measured out in minims, the avoirdupois ounce must be dissolved in water made up to 437.5 minims, or 9 ounces 1 dram is near enough. This kind of ambiguity cannot exist in the case of the metric system, where the two subdivisions (weight and measure) run similarly.

The Metric System.

What decimals are? If you don't study the chapter on addition and subtraction of decimals in an arithmetic, then read what follows here. There is no mystery about the metric system nor half the complication which the text-books make of it. I can give it here in a few words. The cubic centimeter (cc.) is the unit of liquid measure. It is equal to about 17 minims of common measure. One fluid ounce is about 30 cc.'s. 1,000 cc.'s make one liter. So much for measures. No minims, fluid drams, ounces, pints, American or English. Now as to weight. One cc. of pure water weighs one gramme. A gramme is thus about 15 grains. An ounce by weight equals about 30 grammes (these are only approximate; we will have the exact figures directly), 1,000 grammes equal one kilogramme—usually abbreviated to "kilo," but not used so much as the expression "1,000 grammes." Kilo equals about 2¼ lbs.

Subdivisions of cc. and Gramme. The prefixes, deci- (tenth), centi- (hundredth), and milli- (thousandth) are joined to the word gramme, but it is far more usual to write these subdivisions thus: .1, .01, .001; and to speak of them as "point one," etc.

There are no special appellations for the subdivisions of the cc. These are written .5 cc., .01 cc., etc. ("half a cc., "point nought one" or one-hundredth of a cc., etc.). Here you have, then, everything which replaces the many variants of the weights and measures in usage in America and England, the gramme, the cc.—with the liter and the kilo as addenda.

Metric Measures in Practice. A box of metric weights from 500 grammes down to .1 gramme supplies our wants as regards weighing. For measures a ten cc. measure (graduated into tenths) replaces the dram or minim graduate. The others of various sizes can be obtained from Chas. H. Loeber, New York (in England from F. H. Taylor & Co., Ennol St., London, E. C.), of the same shape as those now in use, and, indeed, measures graduated in both English metric units are obtainable.

American and English Measures. Unless otherwise stated, English formulæ are made up on Apothecaries' weight.

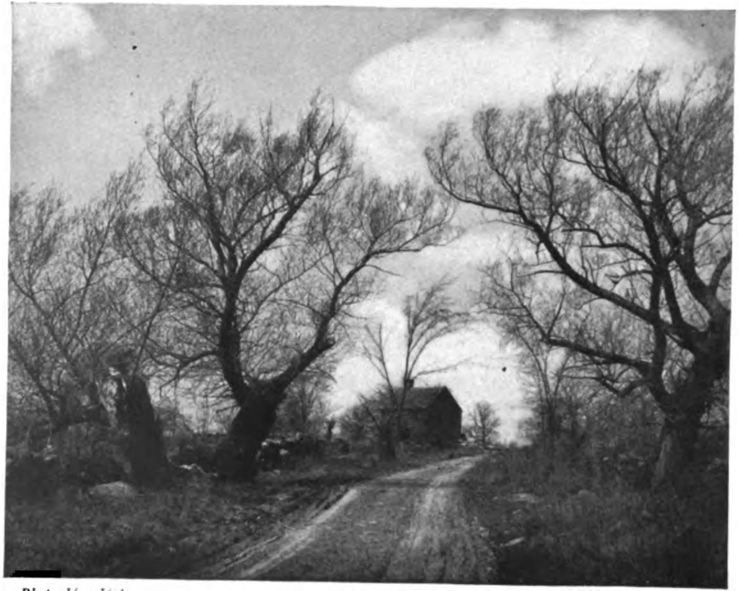
1 scruple = 20 grains
1 dram = 60 grains
1 ounce = 480 grains

Chemicals in England are sold by Avoirdupois weight in which

1 dram = $27\frac{11}{32}$ grains
1 ounce = 437½ grains
1 pound = 7000 grains

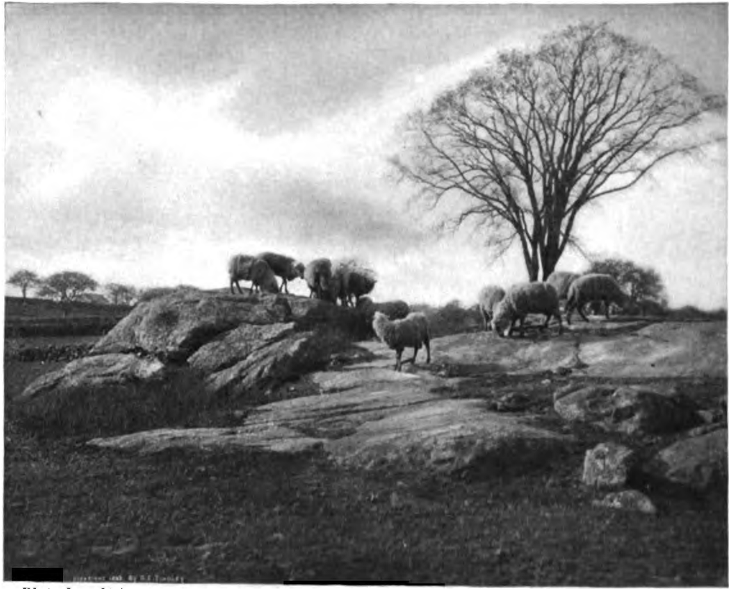
Fluid measure (*English*) used for selling and making up is

1 dram = 60 minims
1 ounce = 8 drams = 480 minims
1 pint = 20 ounces
1 quart = 2 pints = 40 ounces
1 gallon = 4 quarts = 160 ounces



Plat. 7½ x 9½ in.

A SPRING MORNING
George E. Tingley



Plat. 7½ x 9½ in.

SHEEP STUDY
Copyrighted 1899, by George E. Tingley

American Fluid Measure

1 dram = 60 minims
1 ounce = 8 drams = 480 minims
1 pint = 16 ounces
1 quart = 2 pints = 32 ounces
1 gallon = 4 quarts = 128 ounces

Apothecaries' and Avoirdupois weights are used in America as in England. *When giving formulæ*, it would save much labor if writers would give them in grains per ounce (or grains per 10 ounces) or grammes per 1,000 cc.'s. One could thus at once make up a small quantity. When taken into one's own practice it would be easy to draw up a formula in the larger quantities required for stock solutions. Hence I suggest that the most useful preliminary to converting a metric formula into English weights is to obtain the metric weights in grammes per 1,000 cc.'s. It is then quite simple to convert into grains per ounce or minims per ounce.

Converting Metric to Common Measures. The suggestion in the preceding paragraph, which is the result of years of practical usage, is carried out by means of the following table:

Grammes per 1,000 cc.'s	Grains approx.	Per oz. accurate.
1	.4	.438
2	.9	.875
3	1.3	1.313
4	1.8	1.75
5	2.2	2.19
6	2.6	2.63
7	3.1	3.06
8	3.5	3.50
9	3.9	3.94
10	4.4	4.38
11	4.8	4.81
12	5.3	5.25
13	5.7	5.69
14	6.1	6.13
15	5.6	6.56
16	7.0	7.00
17	7.4	7.44
18	7.9	7.88
19	8.3	8.32
20	8.8	8.75
21	9.2	9.19
22	9.6	9.63
23	10.1	10.06
24	10.5	10.50
25	10.9	10.94
26	11.4	11.38
27	11.8	11.81
28	12.3	12.25
29	12.7	12.69
30	13.1	13.13
31	13.6	13.56
32	14.0	14.00
33	14.4	14.44
34	14.9	14.88
35	15.3	15.31
36	15.8	15.75
37	16.2	16.19
38	16.6	16.61
39	17.1	17.06
40	17.5	17.50
41	18.0	17.94
42	18.4	18.38
43	18.8	18.81
44	19.3	19.25
45	19.7	19.69
46	20.1	20.13
47	20.6	20.56
48	21.0	21.00
49	21.4	21.44
50	21.9	21.88

To convert cc.'s per 1,000 cc.'s into minims per ounce, it is almost always sufficiently accurate to divide by 2. More accurately, multiply by .48.

Bear in mind that these figures only give *equivalent proportions*—not actual quantities. These latter are given in the following table:

Grammes to Grains, etc.

Grammes to grains,	multiply by	15.432
“ “ scruples (Ap.),	“ “	1.296
“ “ drams (Ap.),	“ “	3.888
“ “ ounces (Av.),	“ “	.035
“ “ pounds,	“ “	.002205

Cc.'s to Minims, etc.

Cc.'s to minims,	multiply by	16.894
“ “ drams (fl.),	“ “	.282
“ “ ounces (fl.),	“ “	.035

English Equivalents of Metric Measures.

1 gramme = 15.432 grains
100 grammes = 3 ounces; .431 grains (Av.)
1 kilo = 2 pounds; 3 ounces; 1.20 grains (Av.)
1 cc. = 16.9 minims

Accuracy in Weighing. There is such a thing as needless accuracy. It is no good weighing chemicals more accurately than the solutions containing them can be measured. From tests which I got some careful photographic friends to do in conjunction with personal tests some time ago I found that in broad daylight their measurements of solutions (1 or 2 ounces) varied about 1 per cent (1 in 100) on either side of the truth, i. e. total error of 2 per cent. Hence weights can be safely just as inaccurate—but not more so. This means that an "ounce" of say, potassium bromide, may be 4.37 (1-100 of an ounce) more or less than an ounce without "cutting any figure." In other words, it may be 441.8 or 433.1 grains. This means that the trouble of finally adjusting the weight to one-half a grain is simply wasted. When small quantities, 20 grains and less, are being weighed the greatest accuracy must be observed.

Hope for Imperial Weights. The awkwardness of the Imperial weights and measures might be avoided, and almost all the advantages of the metric system obtained by adopting Sir Wm. Abney's suggestion in his "Instruction in Photography," edition of 1900. He says:

"It is much to be desired that dealers should make measures graduated into parts. The present 20-ounce measure would have a capacity of 8,800 grains by weight very nearly, and by increasing it slightly it would be graduated into 10,000 parts. The ordinary 4-ounce measure could also be readily slightly increased in size to show 2,000 parts. Such graduated measures would at once enable photographers to make up solutions according to foreign formulæ, the gramme being taken as a grain and the cubic centimeter as one part."

Making Solutions. There are several factors which contribute to the rapid compounding of a solution—the quality and fineness of division of the chemicals, the temperature of the water and the way the two are mixed. By looking after these points much time and labor can often be saved. Let us consider them in the above order.

The Chemicals. Some substances are very soluble in water and some are not. It is their nature and nothing will alter it. But, nevertheless, there are various devices which the photographer can practice by which he can get over some difficulties nature puts in his way. Let him not forget that the remedies are also nature's. An "anhydrous" salt, i. e., one deprived of water crystallization, dissolves much more quickly than the crystallized substance. Anhydrous sodium carbonate and sodium sulphite (see elsewhere) are two of the best known instances, and are obtainable commercially. Do not suppose that because a salt is anhydrous, it is therefore soluble. The fact is that the anhydrous salt does not lower the temperature of the water in which it dissolves as does the crystallized salt.

A second method of aiding the solution of a salt is to add some second substance which has no effect on the action of the first. A most useful example is that of mercuric chloride. If powdered and mixed with an equal weight of ammonium chloride it dissolves very readily.

Powdering. A wedgewood pestle and mortar is the best thing for powdering chemicals. In purchasing one see that you get a pestle with a fairly flat end. A too rounded end is less efficient for the purposes of the photographer, who does not want exceptional fineness, and is apt to throw the crystals out when used with sudden vigor. Make a point of cleaning the mortar directly after use.

In the absence of a mortar a piece of stout brown paper and a wooden roller or mallet does the work almost as well.

Temperature. The hotter the water the more freely salts dissolve in it, as a general rule. I divide here the common photographic chemicals into 2 classes.

I. *Chemicals dissolving much more quickly if hot water is used:* Oxalic acid, hydroquinone, alum, borax, lead nitrate, mercuric chloride, potassium ferricyanide, potassium ferrocyanide, potassium oxalate, sodium sulphite, sodium thiosulphate (hypo). For these it is worth while to use hot water.

Fig. 4.
Pestle and mortar.

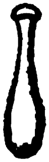


Fig. 5.
Undesirable Pestle.

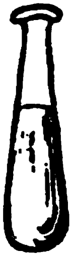


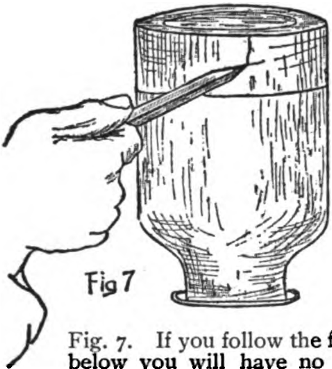
Fig. 6.
Desirable Pestle.

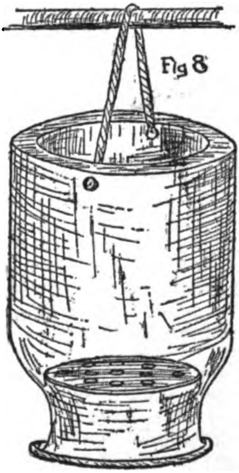
II. *Chemicals dissolving very quickly in cold water:* Ammonium sulphocyanide, ammonium bromide, citric acid, potassium bromide, potassium carbonate, potassium cyanide, potassium bichromate, potassium hydroxide (caustic potash), sodium acetate, sodium carbonate, sodium hydroxide (caustic soda), sodium chloride (common salt), uranium nitrate. For these it is of no advantage to use hot water.

I must add that some salts *must not* be dissolved in hot water if they are to be obtained unaltered in the solution. The chief of these are: Potassium metabisulphite, sodium bicarbonate, sodium sulphantimonate (Schlippe's salt).

To get hot water quickly in the dark-room I prefer a small gas or alcohol stove. Petroleum is not so clean. A small alcohol stove can be had at hardware stores which will boil a pint of water in five or six minutes. It is one of the most handy things you can have in a dark-room or mounting-room.

Quick Solution. The every-day method of dissolving salts, viz., putting them in a bottle and shaking till all have disappeared, is bad, because it needs constant attention. The concentrated solution collects at the bottom of the liquid and protects the solid from the action of the still unsaturated liquid above. Hence the necessity of frequent shaking. The proper method of solution is to suspend the solid at the top of the liquid: it then dissolves without any further attention. A few wide-mouth bottles and cages for holding the salts are all the kit required. Muslin bags are very convenient for the latter, but still better is a glass cage which is very easily made by any one with a little patience. Take a narrow or wide mouth of such diameter that it will go easily into the wide-mouth bottle which is to hold the water. Now you have to cut off the bottom of this bottle so as to get a vessel of about the shape shown in Fig. 7. If you follow the few brief directions given below you will have no difficulty in doing this. First make an ink mark around the bottle at the place where you want the separation. Now with a pointed piece of wrought iron (about ⅜ inch square section and a foot or so in length) heated to a dull redness, start a crack near the bottom of the bottle. By gradually leading this crack you can bring it with perfect certainty up to the ink line and conduct it around the bottle. The whole secret is to do it in easy stages. Lay the iron (with its point towards the termination of the crack — see Fig. 7) only a short distance ahead each time, say ⅜ inch. If you try to rush things by attempting a big jump the crack will wander off across the ink line. A series of short steps spells success.





The crack having been run round, a gentle tap detaches the cracked part and our "dissolver" only requires to have its sharp edges rounded off by rubbing on emery paper to be ready for the next stage of manufacture, which is to fit a perforated plate of ebonite, celluloid, or even zinc into the shoulder, and some arrangement to the top to support it in the mouth of the bottle. A couple of holes (bored as described under "Big Stock Solutions") near the top enable it to be hung from a glass rod laid across the top of the bottle (see Fig. 8); or a wooden or vulcanite ring can be cemented round the top.

To use the apparatus, place a bit of muslin or linen upon the perforated plate, fill up with the weighed salt and suspend in the water. You can then cover the whole up and leave for a few minutes, when you will find the whole dissolved; or, if you are in a hurry, you may first place a little cold water in the bottle and pour hot water thereinto through the charged cage. If the salt to be dissolved is a powder a linen disc on the perforated plate is necessary to prevent the solid washing through undissolved.

I have described a glass cage here because it is easily made and can be used for everything, but it might be made of metal—nickel, silver or aluminum—and many of the fitments sold for the mysterious purposes of the kitchen can be turned to account.

Graduated Cages

In another place I refer to measuring solids instead of weighing them. It is convenient in this regard to scratch a mark upon the cage indicating the weight of some given chemical which it contains up to this point. But the method must be used with precautions elsewhere referred to.

Standard Solutions Without Weighing.

When hypo equal in volume to one fluid ounce of water is dissolved in 10 ounces of water the resulting solution does not occupy 11 fluid ounces, but rather less. The same thing happens in the case of all salts, and although there is no simple means of calculating what the decrease of volume is, experimental results enable us to compound solutions of known strength by this method; i. e. we take a certain volume of water, and add the given salt until the volume reaches a certain increased amount, which previous experiment has shown to represent a definite strength. The way to go about this plan practically is like this, and after a little preliminary trouble a lot of labor is saved. Get a big bottle, holding say, 80 ounces, and place in it, let us say, 60 ounces of water (measured); make a mark where the top of the water comes with a diamond or a strip of gummed paper (top edge, level of liquid). Now we are going to make graduations above this level to indicate how much hypo must be added to make say, fixing bath of 3 or 6 ounces per pint in strength. We weigh out 9 ounces of hypo, dissolve it in the water and make a mark against the water-level. This is the 3 ounces per pint (9 ounces per 60 ounces) mark; add another 9 ounces and make another mark. Dissolve the hypo before you set the mark. These marks having once been made and recollected, there is no need afterwards to weigh. But bear in mind that a mark made for hypo does not hold good for salt or sodium carbonate. Each chemical is different in this respect.

Filtering. Ordinary solutions, like developers, fixing and toning baths, ought to be so made up and with chemicals of such purity that no filtering is necessary, but when one gets a little off the beaten track then filtering often becomes necessary. Filter papers are of various qualities — Rhenish, French and English. French and English are much coarser papers than Rhenish. The ideal paper is that which is strong enough to support large volumes of liquid, without holes through which suspended water can pass, and permitting the liquid itself to pass rapidly. One of the best papers for a photographer's dark-room is Schleicher & Schüll's No. 597, Rhenish, which costs, per 100 5-inch papers, about thirty cents. The funnel makes a lot of difference to the filtering. A ribbed funnel is best, and ribs which wander spirally around the funnel better than those which are vertical. The deeper the ribs the quicker the filtration. There is a funnel sold — Hehner & Richmond's — with specially deep ribs. Small funnels ought to have a fine stem. Such filter quicker. For large funnels, diameter of stem does not matter much, although width is preferable.

How to Fit a Filter Paper. This is another crucial point in rapid filtering and if I go into minute detail it is only that the reader may get hold of a knack which comes by practice and is worth acquiring if one often needs to filter solutions. I quote from an article contributed to *The British Journal of Photography:* Fold the circular paper into two and then again into four, making the last crease lightly. Insert the point into the *dry* funnel and, gently placing the finger in the point of the filter, see what amount of play is possible. If the funnel has an angle of 60° (as it is supposed to have) there will be practically no room for the point of the filter to waggle to and fro. The best results are obtained if the filter be folded so that the point can have about a quarter of an inch play in the point of the funnel. If the first folding does not give this, try again, laying down one edge of the semicircular paper, a little short of the other, and opening out the filter to form a cone of angle either greater or less than 60° as required. Next, place in the funnel and press down the threefold side of the filter, so that the single thickness of paper is pushed against the glass on the opposite side and the point of the filter turned away from the threefold side. Now, holding the funnel in the hand, single paper lowermost, pour water into the filter on the single side. Bring into the vertical position and taking hold of the two sides of the filter at the points where the single and treble thicknesses meet, slightly lift up the paper in the funnel. The stem will at once fill up with water and filtration will take place very rapidly, and will so continue unless the paper gets choked up with precipitate. Do not at first pour so as to fill the filter or it will sink down into the funnel and at once commence to filter more slowly. Keep the filter about half full. Though taking so long to describe, these operations are the work of a few seconds only and become habitual with a little practice.

How to Fold a "Star" Filter. This "star" form aids filtration, especially of large volumes of solution. Fold the paper into a semicircle; next fold this semicircle into two quadrants, and divide each of these quadrants into two by bringing up the edge of each side to the central mark and creasing. The semicircle is at this stage creased into four sections (Fig. 9). We require to divide each of these into two. Bring crease 1 upon 4, and crease. Bring 5 and 2, and similarly crease. Next bring 1 upon 2, and 5 upon 4, and crease in each case. This divides the semicircle into eight sections—all creases being in the same direction. Now turn over and divide each sector (one-eighth of the circle) into two, creasing in the opposite direction. Strengthen the creases by running them between the thumb and finger, open out the filter and place in funnel. One word of

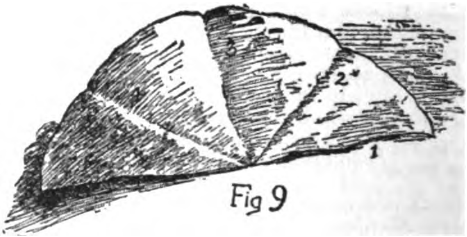


Fig 9

caution: Do not bring the creases too close to the center of the filter, or the excessive creasing will most likely rupture it there. Therefore, soften off the crease around this central point, and it will sit snug.

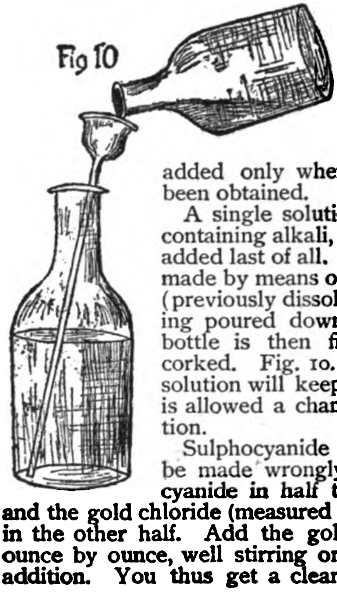
When and When Not to Filter.

Don't filter if you can do anything else. It is better to let any deposit settle (if it will) and pour off the clear liquid above it. You should never filter solutions containing pyro, hydroquinone or other developers which oxidize readily, because filtration exposes the solution so freely to the air. If it is necessary to filter it should be done before the pyro, etc., is added.

Making up Developers, Toning Baths, etc.

As mentioned elsewhere (see Water), the chief impurity from the point of view of compounding developers is dissolved air. Hence it is always best to boil water intended for pyro, and other developers, briskly for a few minutes and to allow it to cool quietly (without shaking). In dissolving the constituents of a developer the sulphite should be mixed with the water first, then the bromide and other salts, if any, and finally the pyro. This order, be it noted, should be reversed in the case of metol, which should be dissolved first in the water and the sulphite added only when a clear solution has been obtained.

Fig 10



A single solution developer, i. e., one containing alkali, ought to have the alkali added last of all. The addition should be made by means of a glass tube, the alkali (previously dissolved in a little water) being poured down to the bottom. The bottle is then filled to the neck and corked. Fig. 10. Made in this way the solution will keep much longer than if it is allowed a chance to commence oxidation.

Sulphocyanide toning baths can easily be made wrongly. Dissolve the sulphocyanide in half the water, say 8 ounces, and the gold chloride (measured out from stock solution) in the other half. Add the gold to the sulphocyanide ounce by ounce, well stirring or shaking between each addition. You thus get a clear, colorless solution. If the gold is added all at once, or the order reversed, the solution is often yellow and does not then contain the proper toning compound. When making both gold and platinum baths water as pure as possible organically (i. e., containing little or no matter from animal or vegetable sources) is advisable; otherwise, the metal is apt to be precipitated on keeping. Distilled water is best in this respect, then spring water and many tap-waters. Soft or rain water is generally bad.

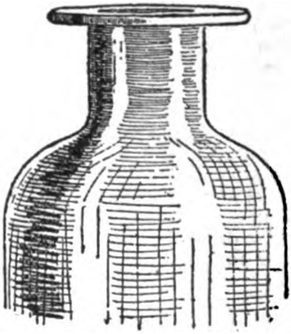


Fig. 11.

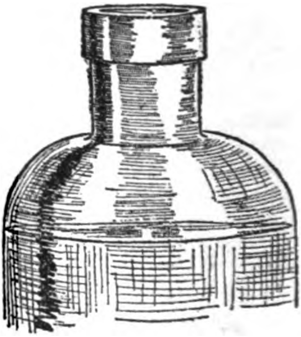


Fig. 12.

Silver salts make a milky solution in most waters (due to chlorides), but this does not matter much if the precipitate be allowed to settle (which it does readily on vigorous shaking) and the solution poured off.

Storing and Measuring Solutions. Under this general heading will be described the storage and measurement of the photographer's working stock-in-trade,—developing, toning, and other solutions in common use.

Bottles. It might be thought that nothing could be said on such an every-day subject, but there are a few points which conduce to comfort in one's dark-room. The type of bottle selected should be one with a thin lip projecting a good way round the rim—not one with a thick, square lip. The former allows the liquid to be poured out without wasting a drop; with the latter it is impossible to deliver small quantities without some of the solution dribbling down the side and into the coat sleeve of the victim. The figures show the respective types. There are endless varieties of lips between the two shown above—which are at opposite ends of the scale as regards pouring well. The kind shown on the left can be bought (glass-stoppered) from any chemical apparatus dealer. Ask for "German glass, flat-stoppered, free from lead." Similar shapes can be had for corks.

Corks or Stoppers. This brings us to ask whether stoppers are better than corks for the photographer's solutions. In most cases they are not; in many, they are not so suitable as corks (e. g., for all alkali solutions), for they are liable to stick. The only instances where a stoppered bottle is really necessary are for solutions of gold chloride and potassium chloroplatinite (which are decomposed and reduced to the metallic state by contact with organic matter like cork), and for strong acids such as hydrochloric and sulphuric, which speedily destroy cork or rubber. For all other solutions corks are just as good as stoppers, bearing in mind that the cork is porous and absorbs the solution which it isolates from the air; the photographer must not therefore indiscriminately transfer corks from one bottle to another without an hour or so soaking in clean water.

Big Stock Solutions. "Winchester quart" bottles,* which hold 80 fluid ounces to the shoulder, are convenient receptacles for such stock solutions as soda carbonate, soda sulphite, etc. I find it a great convenience to fit a tap to the bottom of these, so as to save removing from the shelves and disturbing any sediment which may be at the bottom. Bottles filled with this bottom tap can be bought, but it is very easy to do the job one's self. Get a rat-tail file and some spirits of turpentine. Break off the point of the file, dip it in the turpentine, and fixing on a point about an inch and a half from the bottom of the bottle, scoop out a cavity with the sharp edge of the file, and working the edge round and round at an oblique angle to the glass, proceed till a minute

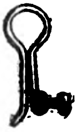


Fig. 14.

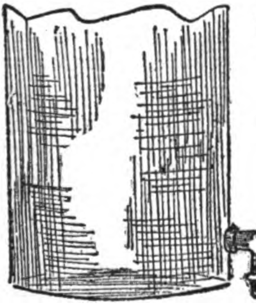


Fig. 13.

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*Bottles of this sort are unknown in America. The common half-gallon bottle, in which mineral (table) waters are sold, is a convenient substitute.—*Editor.*

hole appears at the bottom of the cavity. This is only the work of a minute or two. Now proceed more carefully or you may start a crack. Working the file as before enlarge the hole until the file passes straight through; after which it can be enlarged by straight to-and-fro motion around the sides. Though it sounds long and difficult, this is really perfectly easy. Now fit in the hole a piece of bent glass on which you have slipped a piece of rubber tubing, which makes a perfect joint between tube and bottle; fix another bit of rubber tubing on the outer end of the glass tube, and the stock bottle is complete save for a spring clip.

It is a good plan to paste a broad strip of white paper to the front of the bottle, and, the bottle being placed level on its shelf, to graduate it by withdrawing the solution in doses into a measure and marking, the level of the liquid corresponding to each volume abstracted on the paper strip in bold lines.

Labels. An ordinary gummed label soon comes off in the frequently damp atmosphere of the dark-room. Sized and varnished it will last as long as the bottle, practically. The writer has had such labels in use for years in the acid-laden atmosphere of a chemical laboratory without their showing signs of leaving their supports. Use a thin paper, make the bottle dry and rub the gummed and moistened label down. Then apply a coating of size (1 part of glue in 10 parts of hot water), and, when quite dry, varnish with an "oak" or "church" varnish, i. e., a varnish containing linseed oil. Spirituous varnishes (as used for negatives) do not last so well.

For attaching the labels a mixture of glue and gum is better than gum alone. Here is a good formula which is easily made up: Soak 1 part of the best glue in water until thoroughly swollen, add a little sugar candy, 1 part of gum-arabic and 6 parts of water. Boil with constant stirring over a spirit lamp until the whole gets thin. The moisture does not keep; coat sheets of paper with it, let dry and cut up into convenient sizes.

Ground-Glass Labels. One of the best methods of labeling is to dispense altogether with paper labels, and instead to grind a patch on the bottle with emery powder. The formula can be written on the ground portion with lead pencil. The ground patch is made in a few minutes with a piece of moistened emery cloth, aided by a little emery powder. The writing is removed without any difficulty by rubbing with a piece of hard rubber. It does not wear away or become illegible in use. A coat of varnish can be applied to the patch and the writing thus made quite permanent. But the convenience of the method lies in always having the label at hand (as it were) without having to look around for paper or gum. Large bottles of stock solutions should be labeled in big, bold letters, HYPO, ALUM, etc., in Brunswick black or other good varnish paint. A solution of ordinary sealing wax in methylated spirit is as good as anything. Grind the wax, first alone and afterwards with the solvent before applying.

Cleaning Bottles. I could easily fill pages with directions for cleaning bottles which have contained this or that chemical. But it doesn't pay to spend time over such business. If water does not clean the bottle right away try shaking a little hydrochloric acid in it; if this is of no use, shake up (still with the hydrochloric acid) with shot, or small coal, or coarse sand or something which will scrape the impurity of the side. If this fails, cast the bottle aside as useless.

Solutions That Don't Keep. The permanence or otherwise of a solution is a matter of conditions—generally whether the air gets access to the liquid or not. Two methods of preserving solutions from the action of the air are worth bearing in mind. The first is to store the solution in a lot of small bottles, say 4-ounce capacity, each filled to the lip and well corked. The second is to store the solution in a bottle with a cork at the bottom such as is described above, and to pour a layer of "heavy" paraffin oil on the top of the solution. The oil, although designated heavy, is lighter than water, has no action on any ordinary solution and effectually excludes the air.

Bottles for Developer. The bottles for one's set of solutions, e. g., pyro, bromide and alkali, may very fitly be selected of distinctly different size and shape, so that they cannot be mistaken in the rosy gloom of the dark-room. As suggested some time ago, the bottle proposed for poisons and in shape like a fashion-plate young lady, i. e., nipped in at the middle, might be adopted for pyro were it not to be feared that by a natural association of ideas the photographer might pass from clasping of the waist to pressing to the lips—with disastrous results.

Measuring Solutions. If you look closely at some water standing in a measure you will see that the surface is convex on the under side. Measures are graduated—or are supposed to be graduated—so that they hold the given amount when the lowest point of this curve coincides with the line of the graduation. In measuring volumes of liquid of an ounce and upwards this is a refinement which can be entirely ignored, but when measuring out a few minims it is well to bear in mind that *a* (Fig. 15) is the correct reading for 10 minims, and not *b*.

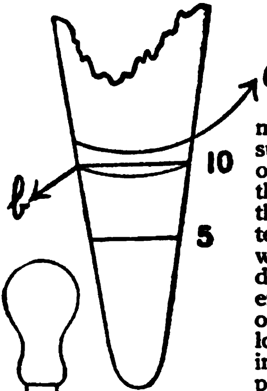

Fig. 15.

Remember, also, when measuring out small volumes such as these (a few minims only) that a large proportion of the liquid clings to the sides of the measure, and unless the latter is rinsed out with a little water you don't get all the indicated solution. The difference is appreciable in measuring out bromide solutions into small lots of developer, gold into toning bath, or platinum chloroplatinite into a platinotype sensitizing solution.

To Measure Small Volumes Quickly.

A very handy fitment is a glass tube drawn out to a fine point at one end and fitted with a rubber teat or bulb at the other, i. e., a fountain pen "filler." It is graduated by scratching with a file at various points, which are best found by trial and error. Stick a scrap of sharp edging at the point where you think the 30-minim mark should be, and, pressing the bulb, draw up some water; expel the water until the level stands at the top of the edging and then discharge the tube into a minim measure, or, more accurately, into a little dish which has been balanced on a balance. (Such are our English weights and measures that 30 minims should weigh 27½ grains!! See elsewhere in this manual.) If the guess is right scratch a mark with a file; if not, try again. A tube of this kind is very easily made and serves to measure solutions, such as bromide, very rapidly and accurately. A good plan is to keep it thrust through the cork of the bottle in which the stock solution is kept. This will necessitate a goodly number of graduated tubes, but will repay the trouble.

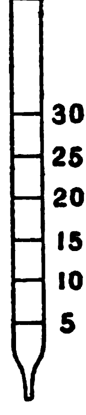

Fig. 16.

Weighing in Semi-darkness. The glass measure has an aptitude of eluding one's vision in the dark-room. It is forced to reveal itself if we provide it with a coating of white enamel paint on its foot and around its upper outside edge. This is one of those absurdly obvious hints which the erudite miss.

When Pouring from a Bottle. Two last hints ought to be so borne in mind that the practice of them becomes habitual. Always keep the label uppermost when pouring from a bottle, so that if any liquid trickles down the side the label misses it. Result—your labels keep clean and legible for much longer. Secondly, if you want to deliver drops (or a very small quantity) of liquid, just moisten the lip of the bottle with the finger. The fluid then trickles out without having to overcome the resistance of a dry patch.

Using Solutions. Under this general heading I want to say some useful things about such things as adjusting temperature, rocking solutions, cleaning dishes. As the last is a necessary preliminary (frequently), we may take it first.

Cleaning Dishes. Dirt, according to the famous definition, "is matter in the wrong place," which is very true in photography, where dirt may be various in kind. I am going to name two reagents for its removal: commercial hydrochloric acid and paper. Commercial hydrochloric acid is a solvent of many precipitates, sediments, deposits, which are not removed by water, and it is pretty safe to say that what is not removed by it must be rubbed off by the second reagent. Keep the spirit mixed with an equal volume of water, and see that you do not splash any of it (neat or diluted) on clothes or upholstery, for it leaves a rotten and stained patch as a memento of its visit. Dishes, measures, etc., if rinsed out once or twice with this liquid are easily made quite clean, as a general rule. Moreover, it decomposes hypo and thus renders innocuous, as regards its subsequent use, any dish which has been used for fixing.*

If the acid will not remove any stain, brisk rubbing with a tuft of any kind of paper will almost always do so. I know of no better way of cleaning right into the corners of dishes than this.

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*If the dish be of porous material (e. g., granatine, "porcelain"), and cracked, it is not safe to assume this, for the hypo or the acid is removed from the cracks with difficulty, though it may do so subsequently sufficiently to cause stains in, say, toning collodio-chloride prints. Moral: Keep your cracked dish, if you must keep it at all, for one particular purpose.

Heating and Cooling Solutions. Developers and other solutions must be kept fairly reasonably around 60° Fahr., i. e., from 55° to 65° Fahr. To do this in summer and winter is not always easy. In winter remember that it is not enough that the developer only be at the right temperature. If the room be nearly down to freezing, the developer will be chilled the moment it is poured into the dish. Where it is not possible to keep the room warmed the following simple arrangement (which Mr. Vero C. Driffield tells me he has found sufficient for all his sensitometric work) is easily made. A large square tank is filled with water at 65° (or other temperature) and a metal frame fitted in the top so that the dish can be immersed to nearly the level of the water (see Fig. 17). Such a large volume of water does not alter in temperature very quickly, and a test every now and then with a thermometer keeps matters right. Those who do not want to go to this trouble should arrange a shelf over their dark-room lamp on which they can place developing dishes or bottles. A little adjustment will enable them to get just the right degree of warmth.

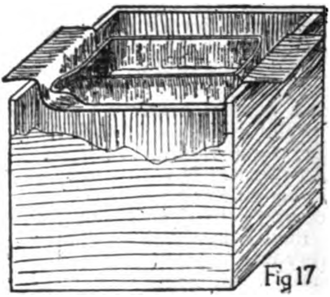
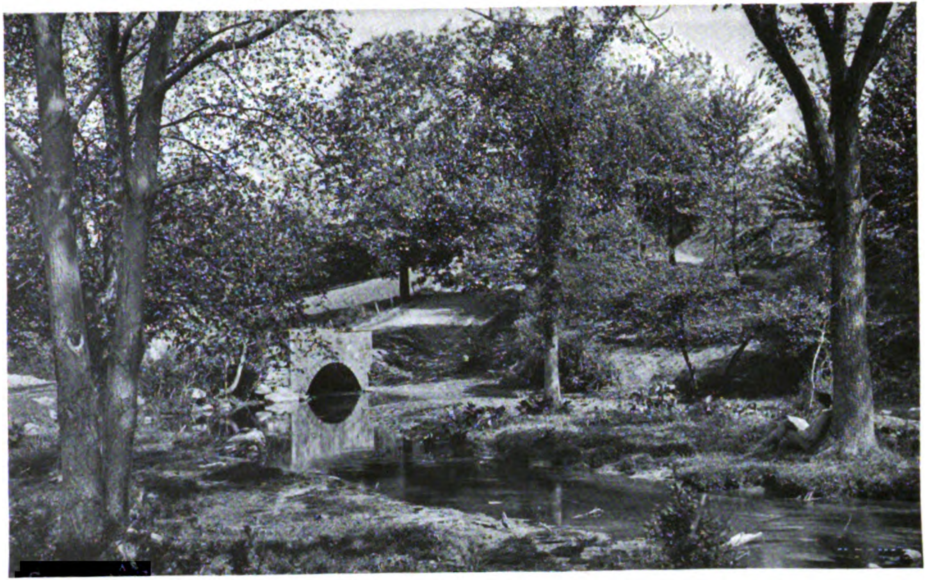


Fig 17

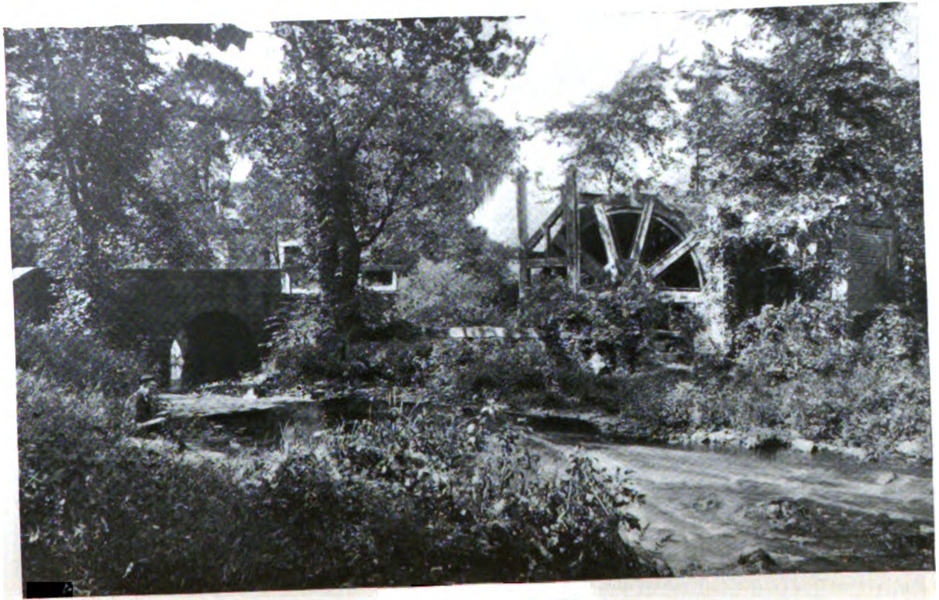
In summer the problem of cooling developing and toning solutions is not so easily solved. In America ice is generally at hand during the summer months. In England it is not so readily obtainable. Where it can be had these difficulties disappear. One way of getting a supply of cooled water is to wrap up a large bottle of the water to be cooled in rags which are placed somewhere in a draught and kept well wetted. The heat absorbed by the evaporation of the water is supplied by the water in the bottle, which thus becomes cooler. It may be added,—though this is getting a little outside the province of this book,—that the less the fingers are placed in the baths used in summer, the better.

Rocking Solutions. Next to temperature the constant movement of a solution is often of importance and a rocker is a dark-room fitment, the comfort of which those who have experienced will be



Alb. 4¾ x 7¾ in.

'DOON THE BURN'
Vernon Royle

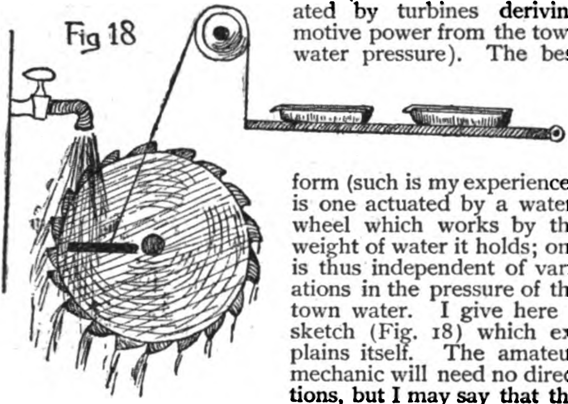


Alb. 4⅝ x 7⅝ in.

ABANDONED POWER
Vernon Royle

loth to forego. Of the many rockers extant, few are practical tools. Some work quite well unloaded, but a half plate dish and plate brings them to a stop. Others work erratically, at times jerking the solution out of the dish (these are those actuated by turbines deriving motive power from the town water pressure). The best form (such is my experience) is one actuated by a water-wheel which works by the weight of water it holds; one is thus independent of variations in the pressure of the town water. I give here a sketch (Fig. 18) which explains itself. The amateur mechanic will need no directions, but I may say that the wheel is made from two discs of tin plate, the cups being soldered to each and is pivoted on a stout brass wire working in a brass tube. If this journal is kept oiled the loss of energy by friction is not over-great. The wheel is not drawn to scale. To rock a couple of half-plate ebonite dishes and developer it should be at least 20 inches in diameter. Almost all photographic solutions act better if rocked during application, i. e., they act more uniformly. But this rule is not universal. The toning mixture of uranium and ferricyanide acts best if used quiescent, owing to the solubility of one of the insoluble ferrocyanides of uranium, which go to form the colored image in iron-printing methods.

Fig 18



Washing Plates and Prints. There is a good deal of misconception of the former of these two operations. The word "washing" suggests the drastic methods of the laundress, and indeed some writers seem to suggest that the hypo and other salts which we aim to remove are "knocked off" the gelatine film by a stream of water something after the manner of the ash from a cigar. As a matter of fact, the removal of hypo from a gelatine depends upon a process of diffusion, not abrasion, the facts about which are, briefly, as follows: Liquids which mix, say pure water and strong hypo solution, do so even though the heavier solution be at the bottom. Thus a layer of strong hypo solution carefully lowered by a funnel to the bottom of some water standing in a tall cylinder will, in course of time, gradually mix as completely as though the whole had been stirred together. The force of diffusion overcomes the attraction of gravity. Had the strong solution been introduced at the top of the water, gravity and diffusion acting together would have brought about this uniform mixture much more rapidly.

"Washing" is Diffusion. Now these facts give the key to the common sense of washing both plates and prints. The gelatine film, fresh from the fixing bath, is full of strong hypo solution. If left at the bottom of a dish of water the hypo will gradually diffuse out, but it will do so much more rapidly if the outgoing solution can fall away from the film, because the rate of diffusion is greatest when the difference in strength of the two solutions is greatest. In other words, we want to intermittently replace the solution next the plate by pure water, so that the strong hypo solution in the film may have the greatest inducement to pass out. If properly conducted this process is not at all slow. Experiments by Haddon & Grundy and by Gaedicke have shown that a series of 5-minute soaks rapidly reduces the residual hypo in plates or paper to a negligible minimum. The number of soaks need not be more than five or six, which means that half an hour's washing practically does everything that can be done.

Negative Washers. The best commercial pattern is a siphon or other washer which allows some space, say 2 inches below the plates, and a depth of water above them equal to the height of the plates. The washer should fill slowly and empty as rapidly as possible (in a few seconds) so that the ideal conditions —quiescent soak and complete removal of soak-water— are approximately realized. There is no advantage in the expensive arrangements for squirting jets of water over the negative. With constant change, an hour's wash at the most is all that is necessary.

Washing Prints. The surest and simplest way of ensuring the frequency of change is by hand, though it is tedious. Remove each print slowly from the fixing bath. Much of the hypo is thus dragged out of the paper by capillary attraction and drains away. Plunge it for an instant into clean water and place in dish (A) of clean water. When all the members of the batch have arrived in A, remove them singly to a second dish

(B) of clean water, taking each from the bottom of the pile. In B they are allowed to soak for ten minutes, the bottom one being continuously brought to the top. They are then taken back—singly, as before—to dish A. This ten-minute soak, agitation and transference to a second dish during the course of an hour will completely free them from hypo and ensure permanency.

The Best Print Washer. Amongst the enormous variety of print washers, really efficient machines are rare, especially those capable of dealing with large prints. The efficiency of a washer is to be judged by how far it permits the complete change of the water without endangering the prints by tearing or without allowing them to clot together. The best plan is to confine them in a series of dishes through which a stream of water passes or which is placed in a box which is alternately filled and exhausted by a siphon. Such a washer is easily made, and it is the only kind in which a number of large prints can be satisfactorily washed.

Home-made Print Washers It would be easy to multiply elaborate descriptions of washers. I will give two only, by two of the best amongst modern technical photographers. W. B. Bolton thus writes in *The British Journal of Photography:* "In the first place I construct a frame of three-eighths inch wood resembling the body of a box without bottom or lid and having an internal measurement of fifteen inches square. This is slit up with a circular saw into trays a quarter or three-eighths of an inch thick. If preferred, the trays may, of course, be made separately, but this is simply a matter of detail depending upon the facilities available in the way of tools and workmanship.

"The trays are provided with bottoms composed of cap muslin or coarse canvas. Mine consists of 'paper-hangers' canvas,' a coarse open material used for laying paper over uneven walls. This is stretched lightly over one side of the tray fixed with small tacks or 'grip pins.' The trays are further subdivided each into six partitions of thin wood, sawed out of Venetian blind laths, the inner frame being made removable so that the same tray may be used if necessary for prints up to 12 x 15. With the inner frame in position, each tray will carry half a dozen half plates or cabinet prints in separate compartments, and may be adapted also for other sizes if such be worked. Six of these trays capable of holding three dozen prints form a block less than three inches thick and should be provided with catches or some arrangement for fixing the whole or any part of them moderately firmly together. The only other necessity is a dish or other vessel to take the block of trays, and this I construct of common one-inch deal flooring boards, tongued and grooved at all the joints and fitted together with screws. When well soaked in water it will be found perfectly water-tight. The depth is that of the width of the flooring board—about six inches.

"Now it is obvious that when the prints are laid in these cells, they are separated from one another by the canvas partitions, and cannot therefore cling together, and though one surface may be in contact with the partition, there is a space of at least a quarter of an inch for the free access of water when the block of trays is immersed in water.

"It is also obvious that the water has free passage in and out of the block, through and amongst the prints, and that the very act of plunging the block into or taking it out of the water sets up a powerful current over the exposed surfaces of all the prints, and that therefore with a very little exertion a most perfect and even violent washing can be given without the least danger of friction or tearing. The partitions effectually prevent the prints floating one on to the other, and the narrow space between the canvas bottoms renders it practically impossible to get the prints doubled or creased.

"In using it, the prints after fixing are passed through one or two changes of water to remove the bulk of the hypo, and are then laid one by one in the cells, and as many frames as may be filled in and fastened or clamped together and plunged to the bottom of the washing trough. The block will float, so some means must be taken to keep it immersed. I simply place a weight on the top of it. The simple lifting up and down of one end of the block at intervals sets the water in motion over the whole surface of the prints, which may thus be very thoroughly washed in the shortest possible time. Further than this, after the prints are once transferred to the cells, the one motion of lifting the block removes the whole at once, and thus the tedious changing one by one is entirely obviated, and the last excuse for neglecting the work removed. I find that after half an hour's washing in six or eight changes of water, in this arrangement, no appreciable traces of hypo are discoverable by ordinary tests."

J. Wabrough Webster (*British Journal of Photography*) mentions a somewhat similar apparatus in which the trays are of metal. This plan is not so desirable and is more difficult for most, but is described for those who prefer to work in metal rather than in wood.

Mr. Webster says: "The construction of the trays was peculiar. It was a first necessity that they should be easily removable. To realize this their framework was made of thick wire bent into a rectangular form slightly smaller than the inside of the trough, with the object of rendering it easy to pass the fingers between a tray and the sides of the trough. To prevent these rectangles slipping over each other through not fitting closely to the box, each wire corner was made into a kind of loop so that the tray fitted exactly in place. To prevent the trays actually touching each other a short small foot was made by soldering a piece of bent wire at each angle of the frame. These were constructed for me by a manufacturer of galvanized wire netting, the whole frame being galvanized after being put together, thus making it compact and free from possible bare iron, which would lead to most undesirable iron rust. The framework made, it was readily converted into a tray by wrapping thin twine tightly around it, beginning at one end and finishing at the other. When the prints were ready to wash, after their first preliminary douche, they were placed one by one on the trays, which were then fitted in the trough, their own weight keeping them down and the water gradually run in by means of an upright pipe running the whole height of the trough and perforated with holes for the issue of minute jets of water. I preferred the use of twine before netting for the supporting medium as it lent itself to causing the print to form a series of furrows, as it were, which allowed the water, when the trough emptied itself, to run off instead of lodging in hollows."

Space has been given to the foregoing descriptions because in this type of washer the photographer who wishes to thoroughly solve for himself the problem of how to wash his prints completely can find suggestions as to how he may meet his own special requirements. To descant on the numerous types of washer would serve no useful purpose. For a few small prints many of them are excellent, but when it comes to a number of say 5 x 7 or half-plate prints difficulties arise which are surmounted more satisfactorily by the separate cell-washer than by any other kind in my experience.*

Washing Enlargements. The extra-large prints, 12 x 15 and upwards, which cannot be got into any apparatus at hand can be handled in several ways. One is to lay the print face down on a

---

*The American worker, less given to home-made apparatus than his British cousin, will find the *Hyatt Washer* quite as convenient and as efficient.—EDITOR.

clean sheet of glass, to squeegee as much of the water out as possible, to soak in water for 5 minutes and to again squeegee. Six such processes will free the print from hypo, or the print may be laid face up on a large piece of ground-glass inclined at a slight angle. A piece of rubber tube, fixed along the upper edge, is perforated with a series of small holes and closed at one end: the other is attached to the tap. The stream of water which thus flows uniformly over the print removes the hypo very well.

A better method is to lay the print face upon a sheet of glass and give it a gentle spraying for at least five minutes, on each side of the print, by means of a piece of rubber tubing fastened to the tap. The end of the tube should be compressed between thumb and forefinger so that the stream of water plays over the print with gentle force, the stream being kept moving.

Before Drying Negatives. To set a negative to dry just as it comes out of the washing tank is not good practice. Many wash waters are hard and leave a white (calcareous) deposit which, though it may do no harm, is untidy and may give rise to patches should the negative be intensified. Moreover, drops of water cling here and there and make places which are much longer in drying. Therefore, having carefully rinsed the negative under the tap, gently mop the gelatine surface with a soft piece of cambric or absorbent cotton until it is surface-dry all over.

Drying Negatives. The rapidity with which a gelatine film dries depends on two things: (1) the dryness of the air in contact with it and (2) the temperature of the air. The greatest rapidity is gained by a combination of these two conditions. The atmosphere, remember, always contains moisture, and the warmer the air the more moisture it can contain. What we want is dry, warm air, and by the "dryness" of air is to be understood air which contains very little moisture compared with the quantity which it can (at its temperature) take up. Thus the air in a warm room may be drier than the atmosphere out of doors because, though containing exactly the same weight of water per cubic foot, the warm interior air can take up more water than the colder external air. These facts ought to be borne in mind. They will save the amateur from doing some of the absurd things which in ignorance of them he sometimes attempts, such as putting negatives to dry in a damp dark-room simply because it is warm.

In a confined space the moisture from a negative will saturate the air with moisture, and so checks drying. Hence the first condition is to get a constant change of air. If this is warm air, all the better. If it is filtered from floating particles of matter, better still.

Drying Racks Are Bad.

About the worst thing on which to dry negatives are the racks sold for this purpose, i. e., if they are anywhere near being fully loaded. About the best plan, on the other hand, requires no special apparatus. Drive into a convenient wall (or into a large board which can be reared up somewhere) a number of iron nails in pairs, the two nails being driven in at a distance apart about equal to the shorter side of the negative. The negative is laid on these nails (see Fig. 19). If it is placed film upwards drying takes place more rapidly; if film downwards, however, there is less chance of dust settling. In order to expedite drying it is a good plan to place these home-made racks some few feet from the floor, and also to arrange an oil stove somewhere near at hand. The current of heated air and products of combustion will greatly decrease the time of drying. A more compact arrangement (of which there are commercial forms) is one in which the plates are set on a vertical rack; and a current of warm gases caused to ascend over them by means of a row of tiny gas jets in the chamber on which the rack is built. This is easily made, and it is well to cover over the upper rack with a framework of fine wire gauze, the floor being likewise covered with the same material. Floating specks of dirt (always to be found in the air of cities) are thus filtered out.

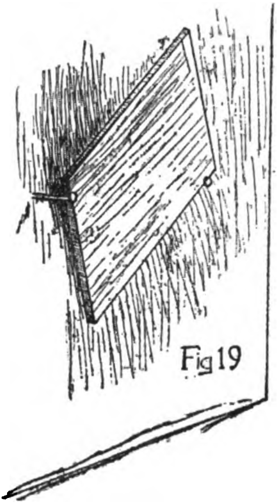


Fig 19

Aids to Rapid Drying.

There are one or two ways of drying a negative rapidly—in a minute or two—which deserve to be mentioned. The first is by methylated spirit (in this country "wood alcohol"). If only a single negative is being handled, simply place it for 5 minutes or so in the alcohol, rocking occasionally, and on removal stand it up to dry, which it will do in a few seconds. But if a large number of plates are being done, it is necessary (to avoid great waste of alcohol) to use two or three baths, for this reason: The first bath gradually becomes weaker (more watery) owing to the accumulation of the water from the films. In this state it cannot do more than produce a plate which still contains a certain proportion of water, and which, though it becomes apparently dry in a few seconds, remains sticky for a very much longer period. By draining off this first water-diluted spirit, and placing in a second bath, the proportion of water in the film is reduced to a negligible quantity and the films dry at once hard and clean. Tanks in which the plates are held vertically are the best for the purpose, and when not in use should be kept covered. As soon as the second bath begins to yield tacky negatives, another should be installed. The first may either be kept in hand until it is useless (being then renewed, as described below), or at once discarded. The latter is more economical, considering the time and trouble involved.

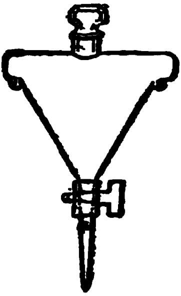


Fig. 20.

To Renew Wet Spirit. Potassium carbonate (dry) takes out the water from wet spirit. It is well to make sure that the commercial "dry" carbonate is really dry by heating it in a shovel or fire-clay crucible to just below redness. If now cooled and added to the spirit it will unite with the water, forming a heavy solution, above which the dry spirit floats. This top layer is poured off into a dry bottle; or if a separating tube (Fig. 20) of the chemist is at hand the potassium solution is tapped off from below.

Drying With Formalin. Place the negative in a bath of formalin (1 vol.) and water (9 vols.) for a few minutes and rinse under the tap afterwards. The film is now hard enough to withstand drying at practically any heat which the hand holding the plate can bear. Alum, chrome alum and the other hardening agents can be used, but they require more washing after use and do not act so vigorously as formalin.

Drying by Hand. If the surface moisture be mopped off the negative with a piece of cambric or fluffless blotting paper, a roller squeegee and gentle pressure being used, it is quite possible to carefully dry the negative over a gas stove or before a fire without the aid of a previous hardening solution. Some plates are better than others in this respect; with those containing soft gelatine (i. e., plates which develop quickly) it is often very risky. Frequently, however, it is quite safe, and it will be noticed that the tendency of the operation is to give a "sparkle" to the negative—an advantage or disadvantage, according to circumstances.

Drying Roll Films. The usual method is to soak the washed films in a weak bath of glycerine, but if possible it is best to avoid this, because the glycerine keeps the film moist (that is why it is used, to keep the film flat) and it is therefore more liable to develop stains either on keeping or in contact with printing papers containing free silver, such as printing-out paper. Some films—generally the thinnest—are more difficult to dry flat than others. The best plan—to avoid glycerine—is to dry in contact with glass. Lay the films, gelatine side up, on a piece of glass and leave to dry. Another is to lay on an inclined board covered with blotting paper. If there is much curl in them when dry, roll them round a cardboard tube for some hours and then lay under pressure.

Paper Prints. As in the case of negatives, drops of water ought to be smoothed off the surface with the finger. The prints will dry much more rapidly if lightly squeegeed on a piece of glass before being hung up. It is surprising that a drying box is not used for prints more frequently than it is. It need only be a very rough affair. I owe this suggestion to Geo. W. Valentine (*British Journal Photographic Almanac*, 1894, p. 750), who says: "Construct a deal box, with close joints, of half-inch wood, 3 feet long by 2 feet wide by 2 feet deep, to contain three or four shelves, each shelf to be covered with clean white blotting paper, fastened at the corners

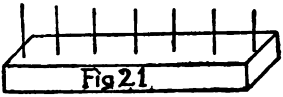


Fig 21.

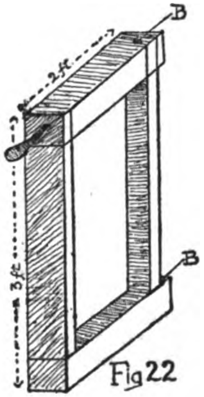


Fig 22

only. A lid for the box must be made of deal, 37 inches long by 1½ inches wide, and to be covered with clean white blotting paper. To use, put the prints on the shelves, face upward, put on the lid and keep drying box in warm place or in the heat of sun, when prints will be found to be thoroughly dry in an hour and a half."

Such an arrangement as this obviously becomes cumbrous if it is to accommodate a number of large prints. The only practical course is to dry in the open room. Of the many arrangements suggested for doing this in the minimum of space, that of Victor A. L. E. Corbould is perhaps the most practical, so I make space for it here from the *British Journal Photographic Almanac*, 1893. Two battens about two inches thick and four feet long are fastened against the wall permanently, parallel to the ground and three feet apart. Into the upper edge of each are driven wire nails, which are left projecting out and the heads are cut off. A series of frames, eight in number, are now made, as in Fig. 22, the projecting ends being about two inches long and having a hole (B) bored through them, so that they can be hung like a gate upon the nails. Into the upper end of each frame is driven a nail (at the point, A), which also projects a short way. The size of each of these frames is two feet wide by three feet long, and is made of light wood. The depth, from side to side, is one inch. Unbleached calico is cut into strips about seventy-five inches long and two feet wide, and the two ends sewed together, making the pieces like miniature roller towels in shape. Eight of such pieces are required, and they are slipped over the frames shown in the figure. The frames are now covered with calico, which can be easily removed and washed when soiled. To each side of these screens the print can be affixed by means of S-shaped pins (Fig. 23). The frames, when in use, are kept from swinging against each other by a

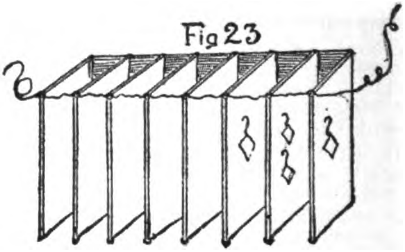


Fig 23

string attached to the wall and twisted round the pin A of each frame. The drying space represents ninety-six square feet. When not in use only the battens remain on the wall, the frames being lifted off and stowed away; but they occupy a very small amount of space, even if left *in situ*, as they swing nearly flat against the wall, or can be entirely removed.

Quickly Drying Prints. It is sometimes recommended to quickly dry prints by treating them with wood alcohol or methylated spirit. This is not generally advisable, for it is apt to leave scum-like marking, but for quick work (bromides for reproduction in the press) it is often useful. Soak the batch of prints in spirits for a couple of minutes, squeegee each print and place in a second spirit bath. Then squeegee again, after which they will dry in a few seconds.

BOOKS.

Dictionary of Photography. By E. J. Wall. Revised to 1897 by Thomas Bolas. 7th edition. 632 pp. $3.75. This, among the several books of its kind, is especially valuable because of the many tables of reference it offers.

Photographic Reference Book. By W. A. Watts. 300 pp. 835 references. Published about 1897. $3.

Reference Book of Practical Photography. By F. Dundas Todd. Part I, 1898. Part II, 1899. 50 cents each.

NOTES.

In good time for the changeful skies of April, THE PHOTO-MINIATURE for March will bring an interesting little book on Photographing Clouds, presenting, as usual, all the practical information available on the subject. There have been many requests for a hand-book to this delightful field of photographic work, but we have waited for the man who could write about it in an interesting and helpful way. Just in the nick of time the man was discovered, and the book, with its dainty illustrations by masters in cloud photography, will be ready in a few weeks.

Incidentally, the March number will close the second volume of THE PHOTO-MINIATURE, and will contain a generously full index of the twelve numbers from April, 1900, to March, 1901. In the same number we hope to make announcement of certain attractive monographs in preparation for Volume III.

◆

"The poor ye have always with you." Jex Bardwell, of Detroit, veteran photographer and generous contributor to photographic literature for the past thirty years, has been very ill and is in desperate circumstances. Apart from his daily necessities, the rent for his little home in 1900 ($72) is past due and worries him. Can we not help him? Any sums received from readers of THE PHOTO-MINIATURE marked "Jex Bardwell" will be gladly forwarded by the editor.

◆

It has been suggested that a better comparison could be made of the illustrations appearing in THE PHOTO-MINIATURE if our readers could know the size of the original print and the sort of print from which the reproduction was made. We, therefore, put aside our dislike to burden our illustrations with technical details, and will hereafter briefly indicate the particulars desired. Thus "Alb. 3 x 4¼" will signify that the original print was on albumen paper of the size mentioned; "Sepia Plat." will indicate sepia platinum; "Plat.," platinum; "Sil. Plat.,"

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a silver print toned with platinum; and P. O. P., a print on print-out paper, i. e., collodio- or gelatino-chloride. These abbreviations, we believe, will be readily understood without repetition of this explanation.

For our own part, when we look at a picture, we desire neither title, technical details, or maker's name. If the picture is interesting we are satisfied. When a particular scene or locality is photographed, or the picture portrays an individual, then, of course, particulars may add interest. But, of all things, may Heaven keep us from the practice of adding poetic legends to our pictures!

◆

The annual meeting of the Photographers' Copyright League was held in New York January 31, under the leadership of Mr. B. J. Falk. Many prominent photographers interested in the question of copyright were present. The usual arrangements were made for the carrying on of the League's work during 1901, and certain plans were discussed whereby the usefulness of the League might be spread over a wider field.

When one considers for a moment that the world of today depends most largely upon photography for its pictures—in newspapers, periodicals, and books—the apathy which marks the attitude of amateur and professional photographers towards the question of copyright is indeed lamentable. How to replace this apathy by enthusiasm, or even intelligent interest, is the difficulty. Photographers, as a general thing, wait until a publisher pirates some pet picture or other, and then howl for all the relief the law affords. Amateur photographers, as a class, are behind the times in this matter, although well abreast of the times in others less important. We advise the readers of THE PHOTO-MINIATURE to apply to Mr. Chas. E. Bolles, 244 Fulton street, Brooklyn, N. Y., for information concerning the Copyright League and its work, and to give their attention to the matter. Mr. Bolles is the secretary of the League, and will enroll those who desire to become members without charge or fee.

An interesting paper on "Copyright," from the amateur point of view, appears in the current number of *The Journal of the Photographic Society of Philadelphia*, and is reprinted in the March issue of *Wilson's Photographic Magazine*. The paper is from the pen of Mr. George Vaux, Jr., and contains a clear statement of several copyright issues recently decided by the courts.

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In the same number of the *Journal of the Photographic Society of Philadelphia* (December–January) may be found a practical consideration of the important question, "When Is a Plate Fixed?" by Mr. Prescott Adamson; a continuation of the Monograph on "Modern Photographic Lenses," by Mr. L. J. R. Holtz, and a temperate critique on the "Members' Annual Exhibition," by Mr. C. Yarnall Abbott.

◆

From Vienna comes the sad news of the death of Herr Ottomar Volkmer, president of the Vienna Photographic Society, and one of the highest European authorities on things photographic. Herr Volkmer had reached his sixty-third year, and was the author of many valuable text-books relating to photography.

◆

Everybody's Magazine for March is an unusually interesting number from the photographic point of view. The place of honor is given to an estimate of "Photography as a Fine Art," by Charles H. Caffin, which is illustrated with numerous examples of photography, pictorial and otherwise. Mr. A. R. Dugmore contributes an entertaining paper on "The Outlaw," a character study of a beaver who was cast out by his companions, with some wonderful illustrations from life; and, finally, there is a readable paper on "The Making of a Country Home" by J. P. Mowbray, illustrated by Gertrude Käsebier in characteristic style.

◆

Mr. S. C. Workman, Torrington, Conn., writes to the Bausch & Lomb Optical Co. concerning a new (?) use for their well-known *Ray Filter*. This consists in using the *Ray Filter* as a non-actinic but translucent lens cap, allowing one to focus the image (in enlarging) direct upon the sensitive bromide paper. The hint is a useful one and may be new as far as the *B. & L. Ray Filter* is concerned. The use of a lens cap fitted with a yellow screen for the above purpose is, however, as old as the hills.

◆

Two English amateurs, Messrs. Harry Quilter and Fred C. Shardlow, of St. Martin's, Leicester, Eng., have launched a new paper, entitled, "The Photographic Art Journal," which possesses several desirable features. It aims to represent, by illustrations of the highest class, the work of all the various schools of photography. The

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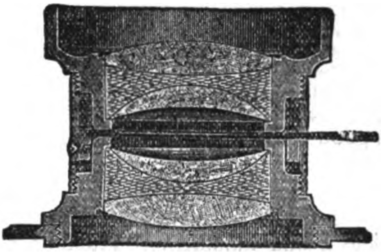

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initial number consists of 32 pp, 6 x 10 inches, on coated paper, enclosed within a serviceable cover. The illustrations (one on every page almost) are of fair size and have been printed with unusual care. The text accompanying the pictures is somewhat clumsily spread over the page to suit our ideas, but this is a slight defect which later issues may remedy. Altogether the *Journal* is one which promises well, and its originators have our sincere congratulations and good wishes for their success.

◆

Ever since the advent of the gelatine dry-plate its lack of sensitiveness to the reds and yellows has been its most grievous defect, and innumerable attempts have been made to overcome this defect. Until recently we had supposed that the *Spectrum* plate made by Cadett & Neall was the highest achievement in the making of plates sensitive to the red end of the spectrum. A few days ago, however, we saw the result of a series of tests in which *Spectrum* and *Lovell's Color Differentiating* plates were exposed side by side on the same subject. The resulting negatives proved conclusively that the the *Lovell C. D.* plate is immeasurably superior to the *Spectrum* plate, both in the reproduction of reds and yellows and in the other important details of speed. This is an interesting fact and deserves record.

As further showing the sensitiveness of the *Lovell C. D.* plate to red we were shown a negative full of desirable qualities, made on a *C. D.* plate through a piece of ruby glass, such as may be found in the better sort of dark-room lanterns. The exposure in this instance was five minutes, the subject being a lithograph in at least six colors. The resulting print was crisp and the delicate modeling was fully preserved.

◆

Our Californian contemporary *Camera Craft* sustains the interest of its early numbers in an admirable way. The February number is almost completely devoted to the San Francisco Photographic Salon, and is a bit of work of which its editors and publishers may well be proud. Those who desire to see what the West is doing in photography should obtain a copy of this pictorial number. (Camera Craft Pub. Co., San Francisco. 15 cts.)

◆

Professor E. C. Pickering, of the Harvard Astronomical Observatory, has been awarded the much-coveted gold

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medal of the Royal Astronomical Society of Great Britain. The award was made for researches in which registration by photography replaces mere observation.

◆

The Preparation of Gelatino-Bromide Plates. Practical Instructions for Amateurs. By the late W. K. Burton. 18 pp. Price, 50 cents. Gauthier Villars et cie. Paris.

This monograph is a French translation of Mr. Burton's little treatise written some ten years ago. Its purpose is to inform the amateur as to how the plates he uses are made rather than to instruct him in their preparation for his own use. At the same time the reader who may desire to make the experiment will find the book a sufficient guide to success in the work.

◆

Fra Elbertus, "the boss" of all good Roycrofters, gives permission for the following reprint of his delicious "write-up" of Pirie MacDonald from the January number of *The Philistine*. Possibly some of our readers have already seen the original text, but it is too good to be lost.

"Mr. Pirie MacDonald, formerly of Albany, but now of New York city, is a photographer. He calls himself a Photographic Artist—and he is. He has more medals and gets higher prices than any photographer in America. His prices are as high as a church steeple. Pirie is the only man I ever knew, or heard of, who made a fortune taking photographs. He has his limit in every savings bank in Albany, owns a block of flats, and sports an automobile in the park with a bull-dog sitting beside him.

"Pirie of the Medals does not take everybody's picture—he picks his customers. As you enter his place he sizes you up thru a peep-hole from behind the arras, and if your countenance lacks a trace of the classic, Pirie signals his assistant, and you are informed that Mr. MacDonald is in Europe and will not return for a year and a half.

"Mr. MacDonald's specialty until recently has been Society Belles—tall, lissome beauties, proud and haughty, with a wondrous length of limb; these are the kind he liked best. And so famous is MacDonald that sitters have come to him from Rochester, Potsdam, Chambersburg, Rahway and all the country round and gladly paid the price of one hundred simoleons for one portrait, done with that wonderful Rembrandtesque effect, & signed by the artist. Often Pirie would send the fair one home

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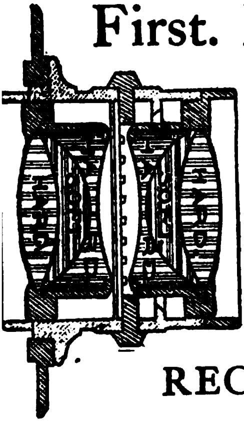

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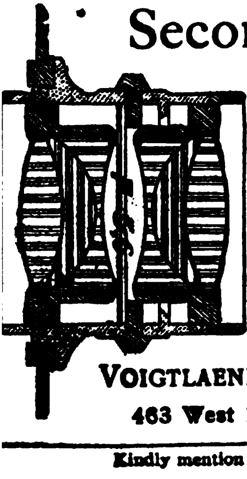

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to change her dress, but if her hair needed rearranging he always attended to that himself. Pirie's skill lay in posing his subject so to get the best result. He usually would sit down with his sitter and talk to her about this or that, and tell her stories, pathetic or comic, and all the time he would be watching her countenance and debating in his mind whether he would pose her as a Madonna, Sappho, Judith, Marguerite or Queen Louise. The Judith-Holofernes pose was his best, but it was often difficult to bring about the feeling that gave attitude. Women want to look pretty, and that was n't what Pirie cared for: he desired chicity-chic, go, biff and éclat. To this end he often had to resort to a scheme to bring the sitter out of her affected self-consciousness. 'Look into my eyes,' he would sometimes command; and when all else failed, Pirie would assume wrath, and declare, 'Here you — why in tarnation can't you do as I want you to!' and he would clap one hand on the beauty's head and the other under her chin and give her a few sharp turns to win'ard, and end by administering a sharp slap athwart her glutei maximus, to straighten her spine.

"By this time the woman would be simply furious and speechless with rage. Then she would sit bolt upright, ready to explode, but she was not given time to go off, for Pirie would step back three steps and shout exultantly, 'Splendid! Hold that — hold that!' and then he would rush forward, kiss her on the cheek and back again he would spring, crying, 'Hold that! Hold that!' and the bulb was pressed.

"And when all was over the artist was so penitent, so humble and beseeching in his manner, so profuse in his explanations that it was all in the interest of Art, that all was forgiven; for base indeed is that woman who is not willing to sacrifice her feelings on the altar of Divine Art. And thus did Pirie get that most wonderful 'Salome,' which was the wonder of the Paris Exposition, and was declared by the judges to be the strongest and most effective study in photography ever exhibited. In every line it showed such a fine feminine rage — such pride and smothered passion — that people looked at it in amazement. No one knew that Pirie had tumbled the woman's hair in one fell grab, and had thus aroused her wrath, and then offered her insult by kissing her and so brought that fine look of burning shame and mingled rage to her proud face.

"It's a great picture and will pay you to stop off at Albany the next time you are down that way and go to the State House and see it.

A SPECIAL NOTE ABOUT DEVELOPMENT

The choice of a developing agent presents no practical difficulty. There are many excellent developers, and choice is a matter of individual preference. THE QUALITY OF THE ALKALIES used is *the important point.* Upon their purity and quality depends the quality of the results secured with any developer. You cannot buy your alkalies with too much care.

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the famous photographer, writes:

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"But the Ideal continually recedes, and Pirie having the true instinct of an artist was fired with an ambition to do still better. The opportunity came, and Pirie, looking out thru the peep-hole, beheld a woman, say of twenty-eight, five feet eleven, weight one hundred and sixty. Her beautiful and abundant hair was bleached, and she had the proud and self-reliant look of one who had conquests that lay behind, and others, greater still, within her grasp. Her neat-fitting jacket and tailor-made gown showed off her fine form to advantage. The strong features were pure Greek.

"Pirie almost screamed with delight, and hastily he ordered his assistant to be gone and leave the customer to him. 'Oh! now we shall have a real Herodias—that Paris picture shall only be a tin-type to this. My! what a splendid tiger she is!'

. . . .

"That is really all we know about the matter. The attendant improved the opportunity to go out on an errand, and when the neighbors in the law office across the hall heard the commotion and rushed out they caught the swish of skirts and got a glimpse of a tailor-made gown going down the stairway. Pirie was found, panting and helpless, in a corner of the studio, with the black cloth viciously knotted around his neck, and the tripod, camera and sitter's throne on top of him. There was a bad scalp wound extending from one ear to the crown of his head, and it looked as though he had been struck with the lens.

"Pirie never made any statements about the matter, but now his card reads:

"PIRIE MACDONALD,
"PHOTOGRAPHIC ARTIST.
"Portraits of Men Only."

◆

In answer to many inquiries, we are glad to make known that materials and supplies for *Ozotype* printing will soon be obtainable in this country. Mr. George Murphy, 57 East Ninth street, New York, has undertaken the American agency for these supplies, and expects to have a complete stock before the end of March. A circular of information, with prices, may be had on application to Mr. Murphy at the address given.

Judging from the demand for Manly's book on *The Ozotype Process* (Tennant & Ward, N. Y., 50 cents), this

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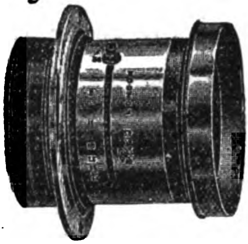

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No.	Equiv. Focus	Plate Covered with Large Stop	Plate Covered with Med'm Stop	Plate Covered with Small Stop	Prices in London
	Inches				*Dollars*
1	5	3¼ x 2½	3¼ x 3¼	4¼ x 3¼	26
2	5½	3¼ x 3¼	4¼ x 3¼	5 x 4	28
3	6	4¼ x 3¼	5 x 4	6½ x 4¾	29
4	7½	5 x 4	6½ x 4¾	7½ x 5	37
5	9	6½ x 4¾	7½ x 5	8½ x 6½	45
6	11	7½ x 5	8½ x 6½	9 x 7	60
7	13	8½ x 6½	9 x 7	10 x 8	77
8	15	10 x 8	12 x 10	13 x 11	102
9	18	12 x 10	13 x 11	15 x 12	135
10	21	13 x 11	15 x 12	18 x 16	180
11	24	15 x 12	18 x 16	22 x 18	232

Five per cent. discount for cash.

The cost of pairing two lenses for stereoscopic work is $2.

The Circle of Illumination includes an angle exceeding 70°

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modified carbon-printing method has awakened unusual interest, and we are looking forward to an opportunity to give it a practical trial.

There have also been inquiries concerning supplies for the *Artigue* Carbon Process. These, we are informed, can be obtained from Mr. Charles H. Loeber, 12 East Seventeenth street, New York, including the particular variety of sawdust required in the development of *Artigue* prints. Mr. Loeber further tells us that he can supply sets of metric weights and measures at a moderate cost—which will answer correspondents upon this somewhat troublesome detail.

◆

Among recent trade novelties worthy of notice we examined, some days ago, a new *Fixing Box*, put out by G. Gennert, 24 East Thirteenth street, New York. This *Fixing Box*, intended for 5 x 7 negatives, is made of a tough fiber material, similar to that used in the construction of the familiar *Duranoid* trays.

The box is a very durable article, but not as clumsily heavy as the older varieties. It may be used at will for stand development or fixing negatives, being equally well adapted for either purpose. This does not mean that we recommend the use of the same box for both operations, although we have seen so prominent a photographer as Mr. Hollinger develop and fix negatives in the same tray!

◆

We are rapidly approaching the day when every dealer in, or manufacturer of, photographic supplies will have his own photographic journal. Among the latest journals of this class is *The Photo-Mirror*, published in St. Louis by H. A. Hyatt. *The Photo-Mirror* is edited by Harry H. Hyatt, and is every whit as bright and reflective as its name implies. The size of the journal is about 6 x 9 inches; it is carefully edited, contains much useful information, and in typographical appearance leaves nothing to be desired. We congratulate both editor and publisher upon the quality of the little book.

◆

We regret to announce the death of Mr. John W. Willard, which took place at Chester, Connecticut, on January 26 last.

Mr. Willard was a pioneer among American photographic merchants, and for over forty years one of the best known men in the trade. A man, also, of sterling

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METOL The quickest and most energetic of developer
Oz., 75c.; lb., $10

ADUROL Best for intensity and contrast
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ORTOL Clear and free from fogging; excellent for developing papers
Oz., 75c.; lb., $10

PYROL Improved form of Pyrogallol, clean, compact, easy to handle
Oz., 30c.; lb., $4

HAUFF

◆

G. GENNERT
Trade Agent
NEW YORK

quality, in whose every-day life and dealings the Christian gentleman was as evident as the alert man of business.

As far back as 1856 Mr. Willard engaged in the selling of photographers' supplies, and in 1867 his house, The Willard Manufacturing Company, was one of the most important of its class in this country. In 1882 Mr. Willard gave up the active management of his business to take charge of a department in the Scovell & Adams concern, and, later, he assumed the editorship of *Snap Shots*, in which work he continued until his death.

❧

The Trades' Directory Publishing Company, of St. Louis, Mo., announces the early publication of a comprehensive and up-to-date directory of professional photographers. There has long been a demand for a reliable work of this kind and, from our knowledge of those behind this venture, we believe that the forthcoming directory will be all that one desires in such a work.

❧

Mr. W. C. Edinger, of Des Moines, Iowa (secretary of the Photographers' Association of Iowa), asks us to call attention to the Eleventh Annual Convention of this flourishing association, to be held at Des Moines May 14 to 16, inclusive. As old-time believers in craft conventions, we make this response with pleasure. Every professional photographer in Iowa and its neighboring states needs the help which the Iowa convention offers, and should lend the affair his enthusiastic support.

The remarkable progress made by American photographers during the past ten years (we would like to emphasize *remarkable progress* in spite of things recently said to the contrary) has been based upon the practical educational advantages offered by the state and national conventions. More power to them, and to the self-sacrificing workers who build these meetings up year after year. We, therefore, urge such Iowa photographers as may read these lines to send to Mr. Edinger for the *Convention Year Book and Prospectus*, and to do their best to make the coming convention memorable in the history of photography in Iowa.

❧

Considering the short time Rotograph Bromide Paper has been on the American market, its popularity is certainly remarkable. A little experience of its quality proves, however, that its high favor is well deserved. It

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Kindly mention The Photo-Miniature

is suitable either for contact work or enlargement, may be printed in daylight or artificial light, and is developed after the usual manner of development papers. Our rough tests with the "free samples" obtainable on request from the manufacturers' agent, show that in all the various sorts of Rotograph paper the worker has the advantage of unusual latitude of exposure, so that the number of spoiled prints may easily be reduced to a minimum. The "sample package" mentioned, with instructions for the use of the various grades, may be obtained from the manufacturers' agent, B. Russegger, 7 West Fourteenth street, New York.

◆

"Wawona," the cleverly printed big tree supplement issued with the Christmas number of our contemporary, *Camera Craft*, of San Francisco, is now obtainable in mounted form at ten cents per copy from *Camera Craft* Publishing Company.

◆

Decidedly interesting, happily proportioned and skilfully put together was Dr. John Nicol's account of *The Progress of Photography* in the "Review of the XIXth Century" published by the *New York Saturday Evening Post*. We mention the matter at this late date because there is occasional enquiry for a readable account of the evolution of photography, and Dr. Nicol's contribution exactly meets this want.

◆

The Eastman Kodak Company, Rochester, N. Y., sends to our table a dainty booklet entitled "Pocket Kodak Portraiture," of which all hand-camera workers should secure a copy for themselves. The text and pictures were supplied by Rudolph Eickemeyer, Jr., who therein proves himself to be a past master in the successful use of the *Pocket Kodak*. The instructions given are plain and to the point, and the pictures illustrate the possibilities of the instrument in a very delightful fashion. It is not improbable, to our mind, that the demand for *Pocket Kodaks* will not fall far short of the demand for the booklet—for which end 'twas made.

◆

The new *List of Photographic Books*, concerning which a thousand tongues have been clamorous for some months past, is ready at last. It contains nearly two hundred titles of as many desirable books on photog-

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4 oz.	8 oz.	16 oz.
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A permanent dry powder.
Unequaled in simplicity.
Only to be dissolved in ten parts of water.

Complete reduction takes about five minutes

80 cts. per original bottle of 4 ozs., with screw lid and hollow glass-stopper, serving as measure.
$1.00 per box of ten glass tubes containing ten grammes each.

Pamphlets on developers, second enlarged edition, free on application

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raphy, and may be had for the asking from Tennant & Ward, New York.

◆

We note the announcement of the death in January of the Rev. Hannibal Goodwin, an Episcopal clergyman, of Newark, N. J. Mr. Goodwin was for many years an enthusiastic amateur photographer, the inventor of a well-known line plate or screen for half-tone photo-engraving, and (it is claimed) the inventor of the first roll films, such as are used so largely by amateur photographers today.

◆

An interesting booklet setting forth, with illustrations, the advantages of a *Hand-Camera Telephoto Lens* has been published by the Bausch & Lomb Optical Company, of Rochester, N. Y., who will send copies to those desiring them.

◆

F. H. Collins, Nashua, N. H., advises us that he is prepared to supply, to amateurs and the trade, ready cut binders' board and cloth for making the "cloth-covered frames" described by Mr. J. Horace McFarland in THE PHOTO-MINIATURE, No. 21: *Trimming, Mounting and Framing*. This will be found a convenience by those who have not access to a bindery, and is worth noting.

◆

The 1901 programme of the Richmond (Ind.) Camera Club comes to us from Mr. C. W. Haseltine, and proves once more that the amateurs of that town have a larger share of pluck and vim than many older and larger societies can boast. The first item on the programme announces a discussion on that perplexing question, "Why are my pictures not as good as the other fellow's?"

◆

Trade News for January (W. D. Gatchel & Sons, Louisville, Ky.) was in several ways a notable bit of photographic journalism. Messrs. Gatchel publish *Trade News* regularly during the year as a medium of communication among the professional photographers of the southern states. Apparently realizing that the southern photographers required a bigger missionary effort than they could manage alone, they generously devoted the January number of *Trade News* to an extended write-up of American photographic journals, without favor or prejudice, so that

ROTOGRAPH PAPER

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A—Thin	**C—Thin Smooth**
B—Thick	**D—Thick Smooth**
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NOTE—PRICES THE SAME FOR ALL GRADES

This paper, new to this country a month or so ago, but with an established European reputation of many years, is now known to every one as the very best Bromide of Silver paper on the market. It has *great latitude of exposure*, can be worked with almost *any developer*, and yields prints of exceeding beauty, clear in the shadows, brilliant in the high lights, and with no tendency towards fogging or stains. The sale of

ROTOGRAPH PAPER

has been increasing daily until it has reached an unexpected point while, inside of the short period named, we have received hundreds of testimonials from well-known photographers stating that Rotograph Paper is giving *best results* and is *superior* to any other paper.

Special Notice

Owing to the numerous complaints we have received from intending purchasers of our goods, to the effect that many dealers in photographic supplies throughout the country are unable to supply Rotograph Paper on account of certain trade restrictions, we beg to state that hereafter where parties cannot obtain our goods or an effort is made to substitute other brands, we will be pleased to fill orders direct at prices named in our Price-list of January 8, 1901, and *deliver goods free of charge* to the customers, irrespective of size of order or locality.

On application we will gladly furnish the name of the nearest dealer who can *supply* our paper on the same terms.

Samples on application

NEUE PHOTOGRAPHISCHE GESELLSCHAFT, A. G.

B. RUSSEGGER, Selling Agent

7 West 14th Street, NEW YORK

the sluggish photographer might know how many good things he had missed in the past, and thereby be persuaded to vigorous amendment. The work was worth doing, and was done well.

❧

A couple of weeks ago Mr. George E. Mellen, Expert, Chicago, sent to our table a copy of his latest *brochure*, titled "Pictures and Pointers." Mr. Mellen, as "Expert" indicates, is a recognized authority on certain subjects, and, although we have forgotten what the book was about, we recall the fact that it was quite as interesting as the other Mellen books—which is no slight praise. His paragraph about THE PHOTO-MINIATURE, in particular, impressed us so strongly that we promptly sent him a dollar for ten extra copies for presentation, marked, to the editorial staff of the *Photo Era* and other learned bodies, among whom we count many admiring friends. Most unfortunately, the ten extra copies, with our own precious editorial copy, have completely disappeared, so that we are unable to do more than mention our good intentions concerning Mr. Mellen's little book. The curious can obtain a copy by sending five 2-cent stamps to Mr. Mellen, addressed as above.

❧

The ladies of the Channing Club, Berkeley, California, have inaugurated a photographic competition, open to all amateur photographers, and will display the prints submitted at a public exhibition to be held April 11 and 12. Full particulars as to the rules governing competitors, awards, etc., may be had by addressing Miss Jessie Milliken, 2601 Parker street, Berkeley, Cal.

❧

The importance of the alkalies used in the development of negatives, i. e., the influence which the quality of the alkalies has upon the final result, is a point generally neglected by the amateur photographer. There can be no doubt but that the finer qualities of a negative may be lost if the alkalies employed are contaminated, or lacking in purity. This was plainly demonstrated in our own practice a few days ago, after using a developer compounded with Seed's new *sulphite* and *carbonate of soda*. The negatives we then obtained possess a noticeable brilliancy, rarely secured in previous developments when the same formula was employed; from which it appears

A Plate which combines all the advantages of ordinary and orthochromatic plates

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Positively the best orthochromatic plate in the market. A trial will convince. May be used for the majority of subjects without a color screen

Its use offers the following advantages:

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Correct Color Sensitiveness

giving a true rendering of the tone values in the subject

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that the claims made for these sodas by the M. A. Seed D. P. Co. are statements of fact, and not merely advertising phrases.

* * *

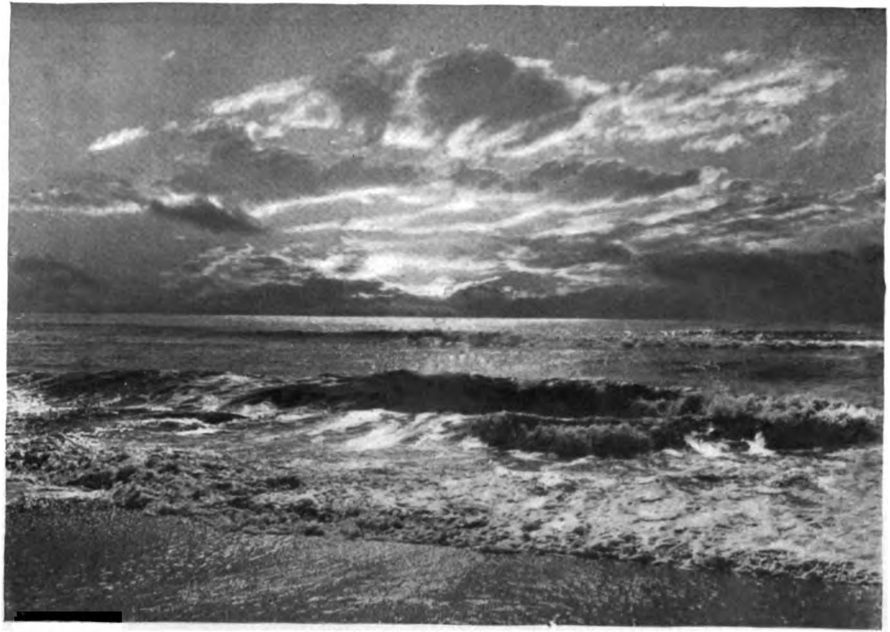
The subjoined report upon the AGFA intensifier is interesting, as coming from Mr. C. H. Bothamley, whose opinion may be relied upon in all details bearing upon negative-making:

"The Agfa intensifier is a colorless, odorless liquid, which, before use, is to be diluted with water, in the proportion of one part of the intensifier and nine parts of water. When a negative, previously well washed, is immersed in this diluted solution it gradually gains in opacity without being stained in any way, if the washing, after fixing, has been done with reasonable care. The intensification proceeds gradually and can readily be controlled. The minimum intensification obtainable is usually reached in twelve to fifteen minutes at the ordinary temperature, after which the negative should be thoroughly washed. No further treatment is necessary. The intensified image seems to be stable, and shows no signs of fading, even after several days' exposure to direct sunlight. On the contrary, negatives so tested increased slightly in opacity.

"The process is very simple, only one operation being necessary. The intensification obtained is greater than with mercuric chloride or mercuric bromide, and if, on the other hand, it is not so great as that obtained by the mercuric bromide and silver cyanide method, the Agfa process has the advantage of being much simpler whilst it gives sufficient intensification for all ordinary cases. The Agfa process is also superior to the mercuric chloride and ammonia process in the greater permanence of the intensified image.

"If negatives are left in the intensifier, after the maximum effect has been produced, the opacity begins to diminish, and the image, when viewed by reflected light, has a bleached appearance. Should this happen, it is only necessary to wash the negative thoroughly with water and then to treat it with an ordinary developer, when a strongly intensified image of a black color is obtained.

"The intensifier can be applied to lantern slides with very satisfactory results. The brown color of the intensified image is very suitable to most subjects, and the deposit is not likely to fade."



Plat. 4½ x 6½

THE BEGINNING OF A NEW DAY

Osborne I. Yellott

Pittsburg Salon, 1898

THE PHOTO-MINIATURE

A Magazine of Photographic Information

EDITED BY JOHN A. TENNANT

Vol. II MARCH, 1901 No. 24

PHOTOGRAPHING CLOUDS.

As one by one these little books of THE PHOTO-MINIATURE series are gathered together to fill the empty niches in photographic literature, the wonder in me grows to see how the empty niches multiply. There are, indeed, those who say that we have already too many books about photography. These, however, speak unwisely, lacking discrimination, and being deceived by mere bulk. That we have photographic information a-plenty may, perhaps, be admitted. But, as the reader is well aware, it deals overmuch in generalities and of too few things in particular; is largely unclassified and hidden in cumbersome textbooks or journals of past years—is oftentimes inaccessible when most its help is needed.

The development of pictorial photography, for example, has brought us a vast store of information on this subject—books and scattered papers reiterating the broad principles of picture-making out-of-doors, but leaving their application in diverse circumstances to the invention of the individual worker. The field is all too large to be satisfactorily handled in this way. Think for a moment of the manifold glories of the hills under constantly changing moods and aspects; of the possibilities of marsh and lowland streams winding to the sea in mist and sunlight; of the mysteries of light and shadow discovered in forest and glade; of the infinite variety of the sea, and the hundred similar themes awakened during a walk abroad. Shall we attempt to discuss these in a meagre chapter apiece? And what about cloudland—that marvellously beautiful panorama which is unrolled before us everywhere out-of-doors? Shall we dismiss its illimitably varied beauty in a chapter or two? Nay, rather let us have a book devoted to the handling of each theme separately, and let us assure ourselves that, as far as the land of the sky is concerned, no single volume can compass its pictorial opportunities, or suggest more than a few of the thousand ways by which we may secure a lasting record of its everchanging beauty.

The early workers in photography gave comparatively little heed to the sky in their picture-making. It presented technical difficulties which their imperfect processes could hardly overcome. Thus they got rid of as much of the sky as was possible by placing the horizon high up in their pictures. A notable exception is found in the remarkable photographs of sea and clouds made by Gustav LeGray about forty years ago, hardly surpassed in beauty by the more recent sea pieces by Worsley-Benison.

H. P. Robinson, in his *Pictorial Effect in Photography*, was, I believe, the first to urge upon photographers the importance of the sky as an aid in landscape composition. Since his day photographers have given more and more attention to the subject and, aided by plates corrected for color reproduction and other conveniences, have brought the art of landscape photography to a desirable degree of perfection. So general, in fact, is the understanding that an outdoor scene without sky (or tint suggesting sky) is an absurdity, that "baldheaded" or skyless landscapes are crudities perpetrated only by beginners or those ignorant of the rudiments of picture making.

It is not, however, our purpose here to deal with the sky as a pictorial element. This properly belongs to composition, and will be treated of when we have a number of THE PHOTO-MINIATURE on that most interesting of subjects. Meanwhile the reader may profitably follow the chapters on clouds and skies in Hinton's *Practical Pictorial Photography*. The purpose of this monograph is simply to cover the technique of cloud photography, but it would be in nowise complete were it not to warn the reader that there is a pictorial, as well as a technical side to the subject. It may be well, also, to emphasize the fact that clouds are not always needed in landscape photographs. Frequently a mere sky-tint will serve all the requirements of art better than the most delicate of cloud-forms, but a tint of some kind is always needed whenever there is sky space. An expanse of blank white paper can never represent the sky. The monograph this month was written by Mr. Osborne I. Yellott, and embodies his experience in this delightful specialty during the past few years.

EDITOR.

Two Principal Methods.

There are two principal methods of obtaining clouds in photographs. Fortunately it is not necessary at this late day to argue in favor of either of them exclusively. Each has its advantages and its disadvantages. To the photographer of high ideals, who can command every known printing process or method, the "printing-in" method is an absolute necessity. A necessity because it is seldom possible to secure clouds and foregrounds on the same plate in their best possible relations and at the season and hour necessary for perfect results. To such workers it becomes necessary that the landscape be taken when the conditions are most favorable, regardless of the appropriateness of the sky at that time. The clouds in turn are then taken when and as they may be best adapted to the purpose in hand, and the combination of sky and landscape effected in printing.

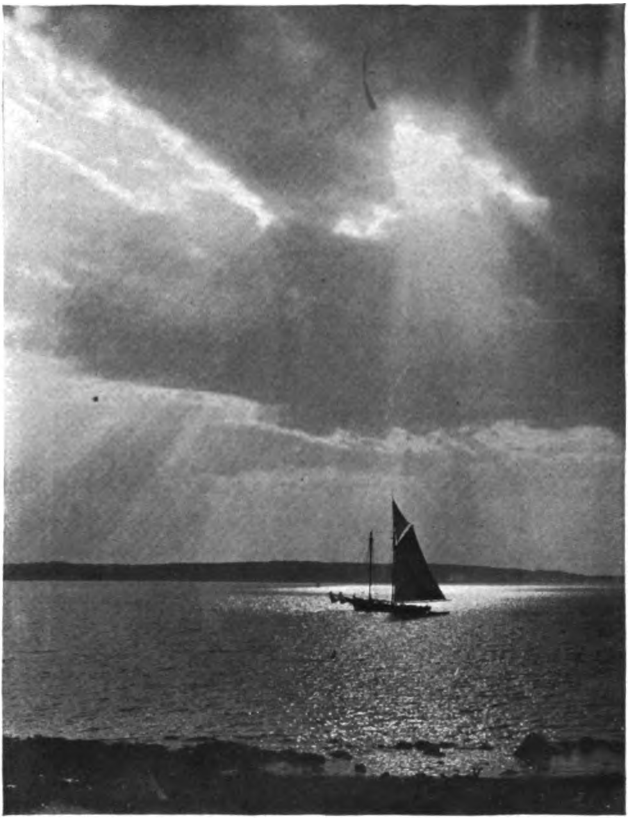
The other method consists in obtaining both clouds and foreground on the one plate in their proper relative printing densities. This method, while not capable of the pictorial possibilities offered by the former method, has many advantages, and will be found easily available for those who would rather go along without clouds in their pictures than take the trouble necessary to print them in by double or combination printing. This trouble, while of little moment with the printing-out papers such as *Solio*, *Albuma* and similar papers, or even with platinotype, a semi-printing-out paper, is by no means inconsiderable where bromide, *Velox*, *Dekko* and other development papers are used. With the latter great care and accuracy are required in properly registering the paper on the negatives in cloud-printing, and numerous trials are necessary before the exact relative exposures for the two negatives are ascertained in order that the two portions of the print may develop up evenly. In lantern-slide making, again, it is no little trouble to either put clouds in by two exposures on the one plate or to make a separate cloud cover-glass which will register accurately. In this branch of work, as in enlarging, carbon printing, and similar methods, it is unquestionably a great convenience to have the clouds and foreground on the one plate. Again, it requires no little artistic ability to select a cloud negative exactly suitable to a given landscape negative in all respects, and many amateurs would be far better satisfied to take their clouds and landscape as nature gives them, placing the blame with nature if the *ensemble* offends the educated eye.*

---

*I have just looked over a collection of thirty or more prints by Mr. C. Grant La Farge made on Cramer's *Isochromatic* plates. In these foreground and cloud forms were secured at one exposure. They equal any results obtained by combination which we have seen. Obviously this method is the simpler of the two.—EDITOR.

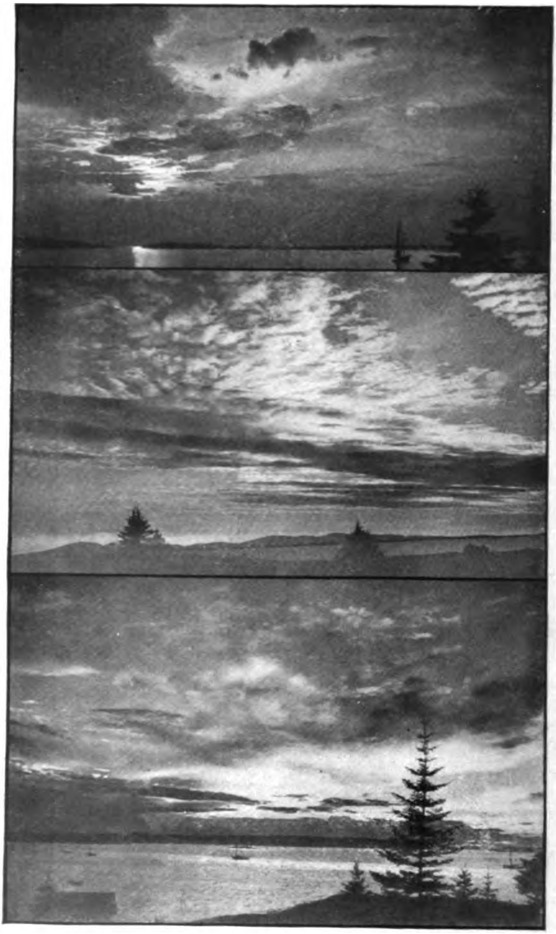
Other Methods. In addition to these two methods of obtaining clouds there are several others more or less used by various classes of workers. The professional photographers who got up a well known portfolio of views of the Paris Exposition used the old and time-worn method of painting the clouds on the back of their negatives with "opaque" of some kind. These clouds, while not altogether satisfactory or true to nature, served their purpose by breaking up what would have been monotonous expanses of blank skies. The method, while not recommended, is one commonly employed by commercial view photographers and can be used whenever the sky of the negative is thin enough to print to a decided tone. If employed to more than suggest cloud forms it demands the same skill as one would require to paint a sky, which few photographers possess. A modification of it is to smoke the back of the negative over a tallow-dip or oil lamp, forming the clouds with the tip of the finger or tuft of cotton lightly applied. The results so obtained are not, however, even most liberally speaking, examples of cloud photography, though it is possible in this way to improve the character of certain classes of prints—of which the less said, the better.

Modified Exposure Methods. There is also a method of obtaining clouds on the plate with the foreground by mechanically cutting off a portion of the light from the sky in making the exposure. This is quite easily done in several ways. One method is to use the focusing-cloth in the place of shutter or lens cap, raising it quickly in front of the lens to make the exposure and then lowering it slowly in order to cut off the light from the sky while still exposing the foreground. Or the lens-cap can be used in the same way, treating its top edge as a pivot and raising it slowly from the bottom, thus veiling the upper portion of the lens during the exposure. Another and more certain method, and one commonly used abroad, is to use a shutter of the curtain or roller-blind variety. With this the view is first focused on the ground glass, and then the curtain or blind lowered until it shuts off the view down to the horizon. The distance to which the blind has been lowered is then carefully noted. The shutter is then set and the greater portion of the exposure made by pulling the shutter-string to that distance, a short auxiliary exposure being then given the sky before concluding the exposure. Anyone having one of these shutters will easily understand these directions. The studio shutter commonly used in England, i. e., one having a hinged flap which may be



P. O. P. 6×8

CLOUD FORMS
C. S. Luitwieler



CLOUD FORMS

1, C. S. Luitwieler; 2, S. I. Carpenter; 3, C. S. Luitwieler raised or lowered at any desired speed, is also an excellent instrument for the work. Needless to say, all of these methods are only possible where the horizon is distant or forms approximately an unbroken line. In the case of near buildings or other large objects projecting some distance above the horizon the method is not available for obvious reasons.

Halation and Its Cure.

The first requirement in cloud photography is to get rid of halation, and this is true whether we are making cloud negatives only, or attempting foreground and clouds on the one plate. In photographing an interior lighted by one or two small windows, one of the first things we notice is the halo or spreading of the light around the windows and all objects near the windows. This halation, as we call it, obliterates the window bars, light hangings, etc., almost entirely. Or if we take a picture of a tree against a brightly lighted sky, we will find that the projecting leaves or branches are very much lighter in tone than the main body of the foliage or the trunk of the tree itself. If we examine the negative, we will find that the window bars or projecting leaves, which should have been almost clear glass, being silhouetted against the light, show evidence of an excess of light-action. The light has, in fact, overspread its natural boundaries. A great many beginners fail to understand this halation, and hence do nothing to remedy it. Those who have advanced a little further know what it is, and partially solve the difficulty by not including windows in their interiors and avoiding trees against a bright light. Photographers, as a rule, rarely realize that there is any halation present unless they can see it. They fail to see that if it is present where a leaf projects against the sky, it must be just as much present in every other portion of the sky. A moment's thought will show that such is the case. For this reason alone in all landscape photography we should use plates prepared to meet this difficulty, known as "backed" or non-halation plates. The main cause of this halation lies in the fact that the strong light penetrates the thin sensitive film, passes through the glass, strikes the plane surface of the back of the plate, and is reflected back into the under side of the film, thus giving a double light action just where the light is already too strong. To correct it the light which passes through the glass must be taken up or absorbed in some way, so that it cannot be reflected back. Some manufacturers remedy this very largely by making what are known as double-coated plates, (a quick-working emulsion coated on a slower emulsion) in which so much of the light is absorbed in passing through the double film that there is practically none to be reflected back. The Seed, Cramer, Hammer, and *Orthonon* double-coated or "Non-Halation" plates belong to this class. They possess great latitude in exposure, are little slower than the fastest, require development in dilute solutions and "fix-out" very slowly. The Lovell plate is also supplied "backed," with a red light-absorbing mixture over which is applied for further security a sheet of black paper. This "backing" is soaked off before developing the plate. With the Lovell backed-plates halation is practically abolished. The writer recently, by way of a test, exposed one of these plates upon an open window with lace curtains for over thirty minutes with No. 32 stop. After fairly careful development in a dilute developer, no halation was discernible, the texture of the curtains remaining perfectly visible, and the cord hanging from the inside blind down the center of the window being easily seen in the print. Many workers prefer to "back" their own plates as required for use. For this purpose there are a number of preparations on the market, some sticky and messy, hard to apply and harder still to remove. The writer, after trying many, now uses exclusively the *E. W. N. Improved Backing*, which comes in a small block and is applied with a brush. A dozen 5 x 7 plates can be "backed" in ten minutes, and by the time the last is backed the first is dry and ready for the plate-holder. Before developing, the plate is held under the tap for a moment to wash off the backing, or it can be developed without previous washing if preferred, as the backing does not injure the solutions. With so convenient a remedy at hand there is no excuse for the photographer permitting halation to stand in the way of his success.

Intensity of Light. We know by observation and experience that the sky is, as a rule, more intensely bright than any part of the landscape proper. A moment's thought tells us that it therefore requires a much shorter exposure than the foreground. It is, in fact, possible to make cloud negatives with the ordinary plates by simply shortening the exposure. The exposure tables all tell us that in photographing clouds we should give one-tenth or one-twelfth the normal exposure. For instance, if in summer, on a bright day, our average landscape requires $\frac{1}{50}$ of a second with the No. 8 stop, then our clouds would require about $\frac{1}{500}$ of a second with that stop or its equivalent with a smaller stop. But in addition to the great intensity of the light from the sky, another factor needs to be considered which common observation or experience may or may not have taught us. We have all no doubt noticed that if we undertake with the ordinary plate, Cramer *Crown*, Seed, Stanley, Lovell, Hammer, or any other that we are accustomed to buy, to photograph a group of children, some in red, some in yellow and some in blue or other colored gowns, our picture will render the red and yellow gowns almost black, while a light blue gown will come out practically white. This is not so only once, but every time, and to the thoughtful must show that there is something wrong with the plates. This is, in fact, the case, and since light blue is the color of the normal sky it follows that this "something wrong" enters very materially into the subject of cloud photography. Therefore, promising in advance that I am not going to be in the slightest degree technical, I would ask my readers to permit a short digression before taking up the practical side of our subject.

The Solar Spectrum. A ray of sunlight passing through a prism and thrown upon a white screen breaks up into what are generally known as the seven primary colors, red, orange, yellow, green, blue, indigo and violet. The effect of these colors upon the human eye has been accurately and scientifically measured, the result being to demonstrate that yellow is the brightest (most luminous) of all, and that on either side of yellow the brightness of the colors falls off more or less regularly, red running into darkness at one end of the spectrum and violet into darkness at the other.

Now the ideal photographic plate should, of course, reproduce the varying luminosities of the spectrum colors as they appear to the eye, but the ordinary photographic plate is by no means ideal in this respect. On the contrary, as far as this plate shows, there are no such things as red and orange light, while yellow and green are barely visible. But blue, which to the eye is little brighter than orange, is shown to be the brightest color in the spectrum. Indigo and violet, both quite dark to the eye, are shown to be almost as bright as blue by the photographic plate. To make the matters worse this peculiar plate records half a dozen or more colors beyond the violet, none of which are visible to the eye, but which the plate says are brighter than yellow. In other words, this ordinary plate is color-blind. It misses entirely the most gorgeous colors in nature, and by way of compensation brings forward a lot of colors that we can't see, and therefore have no desire to reproduce.

Fortunately for the photographer, however, every color has in it so large an amount of white light that, with a full exposure, red, orange, yellow and green objects make some little impression on the photographic plate. This white light is, in fact, so abundant that it is possible, by giving a long enough exposure, to photograph an object with a deep red glass in front of the lens. Experience, however, shows that all these colors "take" darker than they should appear to the eye. Experience also tells us that blue, indigo and violet objects all "take" much lighter than they appear to the eye. Those invisible rays also add their quota to the impression on the plate, and how much of our troubles are due to them we may not know until we get more perfect plates.

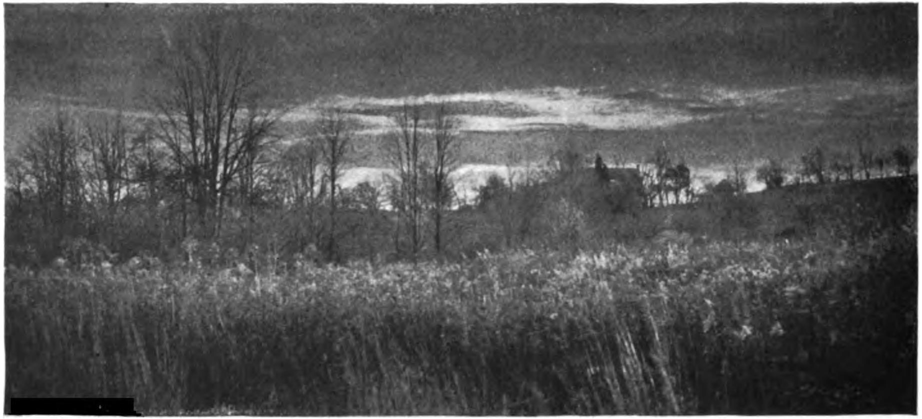
Corrected Plates.

These things have been known to photographers since photography began, and many attempts have been made to sensitize or correct the photographic plate so that it will give the correct luminosity value of colors. A clear explanation of the problem and its solution may be found in THE PHOTO-MINIATURE, No. 6, *Orthochromatic Photography*, and formulæ are therein given for treatment of plates in order to secure the desired results.

We can obtain from any dealer, however, a variety of plates specially prepared for the reproduction of colored objects. Among these are the Cramer *Isochromatic*, medium and instantaneous, the Seed and Carbutt *Polychromatic*, the Lovell *Color-Differentiating* (which, by the way, can be bought ready-backed), the Standard *Orthonon* (a non-halation plate), the Forbes *Orthochromatic* and others. In England the Edwards and *Spectrum* plates are much used. Some of these plates are as fast as the fastest ordinary plates, require but little more care in development and give negatives of excellent quality. In my experience, Cramer's *Isochromatics* have proved themselves perfectly sensitive to yellow and green, but somewhat supersensitive to blue, indigo and violet. The Lovell *C. D.* and Carbutt *Polychromatic* are peculiarly sensitive to red. The other plates named are corrected along the same lines, but all are somewhat supersensitive to the shades of blue. Hence it follows that for cloud-work, at any rate, none of them are as yet perfectly adapted, since the blue sky is bound to have more than its proper relative value to the other colors in nature.

The Color Screen.

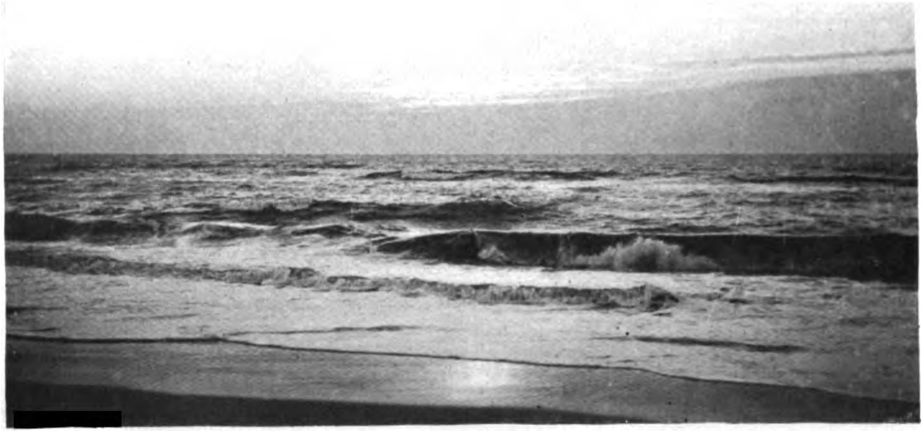
And now I will ask the reader to try a very simple and convincing experiment. Take a piece of light yellow glass or color-screen, or ray-filter, if you have one, and hunt out a chart of the spectrum, such as can be found in some



Sep. P.ul 3 0½

DEPARTED DAY

Osborne I. Yellott



Sil Plat. 2¾ x 6

SUNRISE ON THE OCEAN

Osborne I. Yellott

Philadelphia Salon, 1899

of the dictionaries. If this is not available, get some strips of different colored ribbons or cotton goods, or make a chart with water colors or pastels. Place your yellow glass over the red and you will find it practically unchanged — the orange becomes orange-red-orange, the yellow remains yellow, the green remains green — but now comes the change. The blue becomes a darker green than the spectrum green, the indigo and violet still darker. Here we have the secret of the color-screen. The blue, to which our plates were all supersensitive, becomes, in effect, green, to which our plates are properly or partially sensitive. The indigo and violet both become more or less greenish in tone, and hence are robbed of their high actinic value; the yellow remains yellow, and to it the Cramer plate, at least, is properly sensitive. The orange and red are practically unchanged.

Let us adjust our ray-filter or color-screen and turn the lens on an ordinary landscape, noting the effect on the ground glass. Instead of a view containing a multitude of colors and combination of colors, we have a view practically in green and yellow. The road and other objects of a light tone are yellow, grass and trees are green, our clouds are light yellow and our sky a fairly deep green.

Now for a choice of plate. If we use the ordinary plate we know it will be almost totally insensitive to both yellow and green, which are now the predominating colors. The only way to get a view at all would be to give an exposure sufficiently long for both yellow and green to affect the plate. This all the reference books and directions from the manufacturers tell us to do, the exposure ranging with the different plates and color-screens from seventy-five to three hundred times the normal exposure. This may not amount to very much when we are making cloud negatives pure and simple, where exposures are calculated in minute fractions of a second, but in landscape work, generally, it is hardly a practical solution of the difficulty. In addition to all this, the ordinary plates being practically insensitive to over half of the spectrum, we are really photographing only the different amounts of white light after all.

But we have seen that our corrected plates are more or less sensitive to yellow and green. And inasmuch as our view (with the screen in place) is made up of yellow and green light, it follows that we should properly use a corrected plate with a color-screen. But as the screen absorbs or cuts off a certain amount of light, it is of course necessary to increase the exposure somewhat. With a very light screen, absorbing but little light, we may add a half. With darker screens we increase the exposure just as much as is necessary to compensate for the amount of light cut off. Screens are of so many colors and varieties that it is impossible to give figures. With the Bausch & Lomb *ray-filter*, the normal bichromate solution and the Cramer *Isochromatic* plates, the normal exposure should be multiplied by four.

But of all the plates above named no two are sensitized exactly alike, that is no two give yellow and blue the same relative values. Hence, if we use a screen which will bring these two colors into their absolutely correct relations on one plate, it by no means follows that the same screen will properly correct every other plate. Fortunately it is not necessary to be scientifically accurate in these matters. Any improvement will be welcome after our experience with the ordinary plate, and it follows that if we use a color screen with any corrected plate, we are going to be much more successful than without them. A common error lies in the use of a screen too dark for the plate. The effect of such a screen is to make the blue of the sky such a very dark green that it will practically not photograph at all, when the clouds will appear as tufts of cotton floating in a sea of ink. Such skies as these are to be avoided. I would add that green screens are sometimes used instead of yellow and serve the same purpose.

A Test for the Screen. The most practical test for a color-screen is a field test under normal conditions. First ascertain the proper exposure for a given landscape view, an exposure which (in development) brings up the shadows in good shape, while the high lights are gaining density. Having found this, adjust the screen to the lens. It will be found necessary to focus again, as the screen ordinarily throws the focus out a trifle, especially with wide open lens. Now make three exposures, giving double, treble and quadruple the normal exposure. Develop the plates to get the proper density in the sky, and stop there, regardless of the shadows. After the negatives are dry make a set of proofs. The one which shows a properly exposed foreground indicates the proper factor for the screen, that is, the number by which the normal exposure is to be multiplied in order to get its equivalent exposure with the screen in place. But if upon development of the properly exposed plate, the higher lights in the foreground, or the white clouds in the sky, are so much more dense than the sky itself that the latter prints too dark, it is proof positive that the screen is too dark a yellow. In this case exchange it for one of a lighter shade, or if it is a bichromate of potash ray-filter such as the Bausch & Lomb, dilute the solution with the required quantity of water.

Skies of the class referred to are not always evidence that the screen is too deep in tint or depth of color. Underexposure will give the same effect. With a screen adapted as the above set forth the effect is to overcome the undue light intensity of the sky as well. The blue is therefore really over corrected. Hence in making cloud negatives with such a screen the normal exposure must not be divided by ten as it would be without the screen. The proper exposure for such a screen would be practically the same as that for landscape multiplied by the factor, the entire effort in adapting the screen having been to obtain the exact balance of exposure necessary in obtaining both clouds and foreground on the one plate. If cloud forms alone are to be obtained a much lighter screen can be profitably used, in which event a shorter exposure can be given.

But there is no necessity at all for using different screens on different subjects. The light screen is good for clouds alone, but will not preserve the skies with dark, heavy foregrounds. The darker screen, on the other hand, simply requires a longer exposure for clouds alone, and enables the worker to get the heaviest kind of foregrounds with them. A screen, therefore, is only too dark when it cuts the blue of the sky down so much as to leave it underexposed when the heavy foreground has been fully exposed.

Taking an instance,—the Bausch & Lomb *ray-filter* has been frequently condemned as giving too dark skies. Many workers dilute the solution. By frequent tests, however, the writer has found that it is almost perfectly adapted to the Cramer Isochromatic plates, and that there are no clouds, however light, which cannot be preserved even with the longest kind of exposures, provided the exposure has been properly timed for the foreground and development is stopped at the right point. The data of some of these test exposures will be given later.

Résumé. So far we have been dealing mainly with the theoretical side of cloud photography. We have seen that the ordinary, uncorrected plate is insensitive to certain colors and super-sensitive to others, properly sensitive to none of them. We have seen that the corrected plate has been rendered properly sensitive to two colors at least, but is still supersensitive to blue, the most important color in cloud work. We then saw that by changing this blue to green in effect, by the use of a proper color screen, our plate can be made to render it with nearer its proper relative tone value. And we finally saw that, by over-correcting the blue, we can overcome the undue light intensity of the sky, and thereby manage to get sky and foreground on the one plate under all ordinary conditions. It now remains to take up the practical work of making cloud negatives. This, in view of what has gone before, need not be tedious or difficult, since I will not feel obliged to give reasons for every statement.

Ordinary Plates.

It is a common contention that corrected plates or color-screens are alike unnecessary in ordinary cloud photography. This is true only in a certain measure. Fairly realistic cloud pictures can often be obtained by the use of the ordinary plate. On a dark day, for instance, with heavy clouds against a dark or gray sky, there is obviously no real necessity for the use of a plate corrected as to blue. In this case the normal exposure for an average landscape should be divided by from six to twelve, depending upon the character of the clouds: by six for dark, heavy clouds; by twelve for light fleecy clouds. The plate should be developed slowly in a dilute developer, say one part of a normal developer diluted with four parts of water, the development being stopped before any great density has been gained. The picture "Sunrise on the Ocean" is a single-negative print, made without dodging, and the exposure at 5.45 A. M. on or about the first of September was one-fiftieth of a second, on a Cramer *Crown* (uncorrected) plate. It might be said pretty generally that in marine work the ordinary plate can safely be used and the clouds preserved. The exposure for open marines being about one-tenth the normal and that for the clouds the same, it follows that when one is properly exposed the other will be.

The secret of catching clouds on ordinary plates lies in giving short exposures and developing slowly in dilute developer, as stated. The slightest over-exposure with the normal developer is fatal, but with a dilute developer even an overexposed cloud negative may often be saved. From data before me I find the following exposures: March 12, 5.30 P. M.; sunset view; Stanley plate, stop No. 8, exposure one-half second. Same, stop No. 64, exposure one second. The clouds here are almost as well preserved as in many of my ray-filter negatives made on corrected plates, and are fully as good as those taken on the Stanley plate on the same day with No. 8 stop in one one-hundredth of a second. But in all these development was begun in a very weak solution, one part normal to eight parts water. As the clouds came up more strong developer was added for density, but at no time was a solution of more than one-fourth strength used. By this method of development open foregrounds can frequently be saved on the plate with the clouds.

Corrected Plates.

Corrected or color-sensitive plates, on the other hand, can in very many cases be used without any color-screen whatever, with altogether satisfactory results.* They are all partially corrected as to blue, and hence tend to preserve the contrast between that color and the white of the clouds. Hence in marine or distant landscape views, where the exposures are necessarily short, it is possible to get both clouds and foreground on one plate. The exposure is still one-tenth the normal, since of course the light intensity remains as before, but there is vastly more latitude with them than with the ordinary plate. With brightly lighted foregrounds, the clouds are frequently preserved even after full exposure. With yellow sunsets, a screen is, of course, rarely necessary. Nor is the screen always necessary with them in making straight cloud negatives. Divide the exposure, as before, by from one-sixth to one-twelfth and develop in a dilute developer. Care must be taken in development to screen the plate from the direct rays of the ruby light, and it should be examined as seldom as possible. After the clouds are well out, development may be finished in a stronger solution, but in all cloud-work beware of over-development. The extent of development will depend upon the purpose for which the negative is to be used. If for "printing-in," it should be stopped very early. If for use as a picture in itself, the cloud-negative may well be carried to a fair density, but should never be allowed to become very dense.

The sky portion of the picture "The Beginning of a New Day" is of this class. It was taken on a Cramer *Instantaneous Isochromatic* plate in October, with a No. 32 stop, in one-twenty-fifth of a second without a color-screen. This was on the basis of one-tenth the exposure for average landscape.

Here let me advise the worker to make a few experimental exposures on cloud-forms of different sorts, using one-tenth as the mean and varying the exposure from one-half to one-twentieth. A dozen such exposures, studied by comparison with each other, all the facts about plates and exposures at hand, will tell the intelligent worker more than a book full of theory gotten here or elsewhere. These experiments should include exposures of the same subject with and without a screen.

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*The Cramer Dry Plate Company and the Lovell Dry Plate Company distinctly claim this for their brands, and my experience with slow "color-sensitive" plates confirms the reasonableness of the claim.—EDITOR.

Screen and Plate in Harmony.

The third, the scientific, and withal the most satisfactory because the most intelligent way of making cloud negatives is, as we have seen, by the use of backed color-sensitive plates and a properly adjusted screen or ray-filter. By this method one can do all that can be done by the other methods and a great deal more.

Much theory and much humbug attaches to the color screen. We are told that the screen must be made of "optical glass," perfectly "flatted," the plane surfaces being exactly parallel, and that the tint or color should be spectroscopically tested for the best results. All this is true. The better the tool the better its performance in intelligent hands. But until the reader is justly entitled to indulge the whims of an "expert" he may profitably use whatever form of color screen or ray filter is most convenient. Some of the most pleasing landscapes with clouds I have seen, made by Theodore Pentlarge, were made on orthochromatic plates and a screen consisting of the thin yellow-stained gelatine tissue much used by confectioners. This costs about four cents per sheet of liberal size, is tough and easily renewable. Cheap commercial screens are usually selected pieces of yellow glass set in a metal rim, and selling at from fifty cents to a dollar. A better variety consists of two pieces of "flatted" glass with a film of colored balsam between. These, accurately measured in gradation of tint, may be had for two or three dollars apiece. Nehring has introduced a "convertible" color screen, consisting of a metal cell, into which from one to three glass screens of varying depth may be placed. The best screen is undoubtedly the Bausch & Lomb *Ray-filter*, consisting of a glass cell in metal rim containing a solution of potassium bichromate. With this instrument the depth of tint of the screen may be regulated at will by changing the strength of the bichromate solution. Formulæ for the preparation of such screens may be found in THE PHOTO MINIATURE, No. 6: *Orthochromatic Photography*, wherein also the various forms of color screens and their use have been fully described. With some plates on the market the makers thereof advise only the use of a particular screen which they supply; the Cramer Dry Plate Company and the Lovell Dry Plate Manufacturing Company insist that, for the majority of subjects, their *slow* color sensitive plates should be used without a screen. From this it would appear that the adjustment of exposure is really as important a detail as the choice or use of a ray filter of any sort. This adjustment of exposure must be learned by experience with the plates in hand, the data already given being accepted as a general guide. In working with solutions of potassium bichromate (or the chromate as advised for landscape work) the depth of tint may be varied to suit the season or the subject. Thus a solution of 1 : 100 may be suggested for the more delicate cloud forms; a solution of 1 : 200 to 1 : 400 for cloud forms strongly defined, such as the cumulus variety; while for cirrus clouds we may return to the use of the 1 : 100 solution.

In an earlier number of THE PHOTO MINIATURE (No. 4) the somewhat rash statement was made that the ray-filter was a simple remedy for halation. The statement is here withdrawn as containing more of error than of truth. The fact seems to be that, by cutting down the intensity of the light, a ray-filter minimizes the tendency toward halation according to the depth of the screen—nothing more.

Next to the color the size of the screen is the most important consideration. If too small it will invariably cut off the light from the corners of the plate. For this reason it is always best to buy the largest screen that can be used with a given lens. And even then one must be careful in raising the rising-front of the camera too far, as the screen being practically an extension of the lens-hood, is bound to cut off light from the corners in this case unless very large indeed.

The principle upon which the color-screen works has already been shown. Its practical effect is to enable us to greatly overexpose the sky and at the same time obtain detail in the cloud forms. This is true with either a light screen or a dark one, but with the former the clouds are frequently lost with prolonged exposure, while with the latter there is practically no limit to the overexposure—expose for the shadows and take care of the clouds in development. They may suffer somewhat in matters of delicate detail with very long exposures, but they will always be in the negative.

Exposure. In undertaking to make cloud negatives pure and simple the worker should make several trial exposures with the screen in place until he learns the exactly proper exposure for ordinary clouds under normal conditions. This should be considered the normal exposure for clouds, varying it with varying conditions. For instance, the writer's normal exposure for clouds is $\frac{1}{12}$ of a second with the No. 8 stop, B. & L. *Ray-filter* with normal solution, and Cramer's *Instantaneous Isochromatic* plate. In ordinary landscape work I pay no attention to this, but in making cloud negatives for printing-in purposes, I vary it with different conditions. For instance, with brightly lighted clouds very near the sun in midsummer I have cut my exposure down to $\frac{1}{100}$ of a second, instead of $\frac{1}{12}$, while with heavy sunset clouds I may give a second or more. But with heavy foregrounds, I expose regardless of the clouds and give what the foreground requires, be it one second or twelve, the latter being the longest now in mind with the stop and plate named.

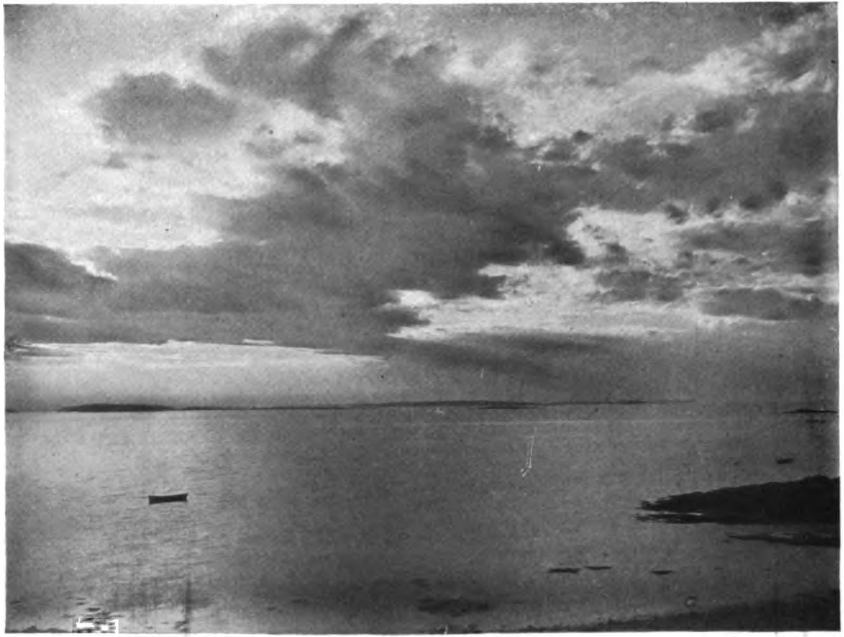
With a color-screen of lighter tint the normal exposure for clouds will necessarily be much shorter than that given above. Messrs. Carpenter and Luitweiler, some of whose cloud studies appear in this number of THE PHOTO-MINIATURE, both use the Burchett (a light green) color-screen of English manufacture and Cramer *Medium Isochromatic* plates. With these their normal exposure is $\frac{1}{25}$ of a second with the No. 16 stop.

Mr. Hinton, a master in pictorial photography, advises a slow plate, a lens working at F/45, and a quick shutter exposure—which in England probably means $\frac{1}{25}$ of a second. All the English workers, in fact, advocate a slow plate, despite the proverbial dulness of their skies.

Development.

The development of negatives made on corrected plates with color-screen or ray-filter differs somewhat from that of plates without the screen. That is, while before it was necessary to develop tentatively and with weak solutions in order to preserve the clouds, development can now be carried on from the start in solutions of full strength. Care must still be taken to stop before the negative gets too dense, and for this reason many workers prefer to work with a developer not over half the normal strength, an additional advantage being that such method of development results in softer negatives.

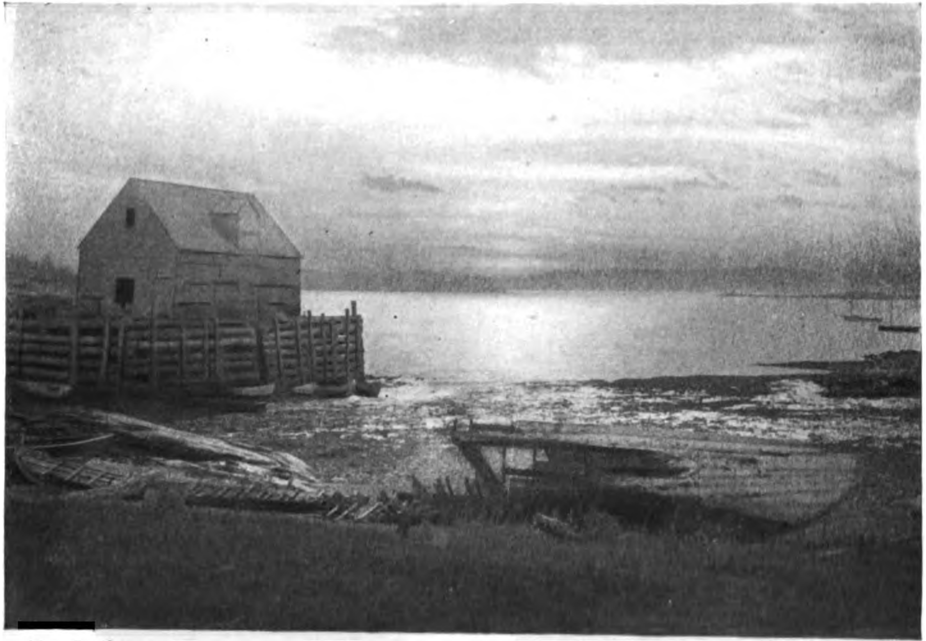
When clouds and foreground are on the one plate, however, the development is the most important stage of the process and must be conducted most carefully. In these cases we should expose for the foreground, regardless of the proper exposure for the clouds. If this has been done, and the screen is reasonably adapted to the plate, the foreground will be well up by the time the sky reaches the proper printing density. It is of importance



P. O. P. 6x8

CLOUD FORMS

S. I. Carpenter



Sep. Plat. 4¾ x 6½

EBB TIDE
Osborne I. Yellott

to stop development at the right point. This arrives at the moment when the sky portion of the negative begins to get a trifle more dense than the foreground. By that time the white clouds will have gained full density and the foreground should be fully developed. But if the foreground appears a little weak when the sky is almost dense enough, do not hesitate to stop development. If development is continued the foreground will gain in density, but meanwhile the sky will be gaining twice as fast. It is far better to have a weak negative with sky and foreground in their proper relations, than a negative with a dense sky and thin foreground. The former can be intensified, the latter will require no end of dodging and trouble in printing.

The best way to gauge the proper density of the sky in developing, is to hold the negative up to the ruby light (cautiously if the plate is orthochromatic), and pass the fingers across its back. The point at which the fingers begin to be but barely visible is the point at which to stop development. With most plates and developers this will give a sky printing to a very slight tone, and that is what we usually want in our landscape negatives. Take care of the sky and, with the proper exposure and screen, the clouds and foreground will take care of themselves.

Local Development.

I have said that if the foreground remains weak after full development of the sky, stop right there. As a rule, that is all right. But it may be that the worker would prefer to avoid subsequent intensification. If, therefore, the sky begins to blacken rapidly in the developer while the foreground remains quite light, this may be taken as conclusive evidence that the two will never get together; in other words, the foreground has been underexposed. In this event remove the plate to a very dilute developer, soak a tuft of cotton in developer of full strength, and with it go carefully over the foreground, under the dilute developer preferably. Gradually the foreground will gather strength. Continue this treatment until the foreground is stronger than the sky. Now place the plate in the developer first employed, and continue development until the sky has reached its proper density. If the foreground has received anything like the proper exposure, this treatment will result in a negative of good printing quality. The picture "Winter Evening" is of this class, the exposure having been inadvertently made a little short for the foreground. As it is, the negative prints without dodging.

An alternative method for correcting slight underexposure of the foreground is to hold back the sky by the application of a weak solution of potassium bromide, the ordinary "restrainer," applying it with a brush or tuft of cotton after wiping the surplus moisture off the face of the negative. The sky portion being thoroughly soaked with this restrainer, the negative is returned to the developer, when the foreground will develop out much more rapidly than the sky. This method is not as certain or as satisfactory as the former, but will be found useful by those who prefer to adopt it.

Branches of Cloud Photography.

Having learned to photograph clouds of all kinds under all possible conditions, it remains to apply our knowledge to the making of pictures containing clouds. To this end we have before us several interesting fields of work which we will consider in their order. First come the pictures of cloud-forms alone, wherein we care little or nothing for the foreground, and aim principally at getting the greatest variety of the most beautiful and attractive clouds. Then comes the making of cloud-negatives, which are to be used exclusively for the purpose of printing-in with our foreground negatives. We have already pretty fully considered the class in which clouds and foreground are on one plate. But there are still a few technical methods of connecting defective negatives so that they will print properly, and these we will consider later.

Cloud Forms.

The making of pictures of cloud-forms, as distinguished from the making of cloud negatives for printing-in purposes, is in itself a wholly delightful hobby. I forbear touching on this branch from the meteorological standpoint. Nothing can be more generally pleasing than a varied collection of cloud pictures considered simply as pictures. Where this is the aim no opportunity should be lost to photograph a pleasing or unusual cloud formation. For this purpose it is well to always keep on hand at least one plate-holder containing backed color-sensitive plates, and reserve them for the purpose. The worker should also learn, by experimental tests, as I have already advised, the correct exposure for normal clouds under normal conditions, with the plate and color-screen in use. He is then always prepared, and can quickly take advantage of his opportunities. The cloud forms change so rapidly that there is rarely time to run to the dark-room and load plate-holders preparatory to taking them. Collections of cloud pictures taken in this way are primarily best in the shape of lantern-slides, since in that medium, as in no other, the sky is rendered with much of its true luminosity. The Seed *G. B.*

P. R. transparency plate, giving a variety of tones by exposure and development alone, will be found the best all-round plate for the purpose, although the ordinary plate, toned with gold, yields pleasing results. If a collection of prints be the end in view, I know of no medium more pleasing than the blue-print, full directions for making which were given in THE PHOTO-MINIATURE, No. 10, *The Blue Print*, etc. Blue-print papers are found in the market of excellent quality, Millen's *French Satin Jr.*, when used fresh, being one of the best, and giving charming results. The writer has in his possession a collection of cloud prints on this paper made from 5 x 7 negatives on 5 x 8 paper, masked to give a white margin of about one-eighth of an inch on three sides, the fourth or left-hand margin being thus about one and one-eighth of an inch and utilized in binding the prints together. The cover is cardboard, covered with white duck previously sensitized presenting a vignetted marine with clouds. A modification of this would be to use much larger paper, giving a margin of several inches. Collections of this kind should be kept intact. A simple cloud picture, without foreground, in a collection of finished views, always strikes one as incomplete.*

Sunsets and Moonlight Effects.

In addition to studies of ordinary cloud forms, sunsets furnish an attractive field for the cloud photographer. These are particularly suggestive when taken across a body of water, the reflection adding greatly to their effect. In this class we find a large number of so-called "moonlight" effects. These are obtained by pointing the camera directly at the sun during the late afternoon, using a small stop and giving a short exposure, carrying the plate far enough in development to get almost white clouds against a dark sky. The pictures by Messrs. Carpenter and Luitweiler are good examples of this class, and were taken with a Burchett screen, No. 16 stop on Cramer *Medium Isochromatic* plates in $\frac{1}{25}$th of a second. Longer exposures make the sky too bright for moonlight effects, and the pictures lose in effectiveness through the lack of marked contrasts. These so-called moonlight pictures requiring such very short exposures, it is quite possible to take them on ordinary plates, preferably backed, or on slow orthochromatic plates without color-screen. In taking pictures including the sun it is better to use a very small stop, since with a large aperture the glare of direct light from the sun has a tendency to flood the whole interior of the camera and thereby fog the plate. This does not occur with the small stop, even with relatively longer exposures.

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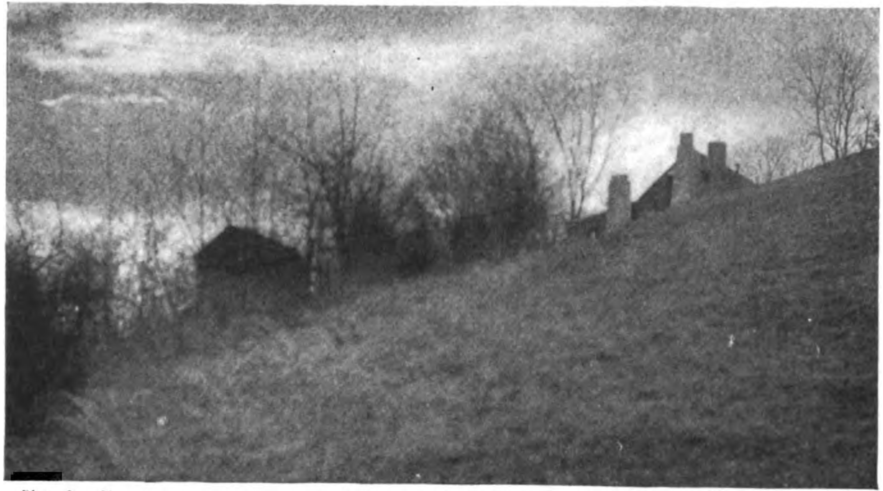
*One of the most remarkable books I have seen was a huge tome containing about one hundred and fifty 6½ x 8½ prints of as many different cloud forms, made by the late C. Piazzi Smyth during the last years of his life. No one could look through such a volume without becoming an enthusiast in cloud photography, the interest and loveliness combined in its pages being irresistible.—EDITOR.

True sunset pictures require longer exposures. The exposure should always be sufficient to show detail in the foreground when the sky has reached the proper density in developing. Too many sunset views fail in this particular and really belong to the "moonlight" class. If the photographer will think for a moment before giving his picture a title, he will see that whenever the sun is above the horizon the earth itself is really quite light, as is the sky. If an evening effect is desired it should be secured by full exposure and slight development, rather than by short exposure and forced development. In sunset pictures, therefore, full exposures should be the rule in order to get true effects. For this reason the color-screen and corrected plates are necessary. With these the exposure may well run way up into the seconds and the clouds be still preserved.

Clouds for "Printing-in." Cloud negatives designed purely for printing-in purposes belong really to a class in themselves. In the first place, much care must be taken in their selection and in choosing the point of view. If a landscape with which clouds are to be used is lighted from the left, obviously the clouds printed in should not be lighted from the right or from any other direction than the left. Nor should clouds be taken at or near the zenith to be printed in at the horizon. The cloud forms, also, should be selected with reference to their composition with the rest of the picture. Again it is always wrong to print sunlit clouds into a landscape taken on a gray day, although we frequently see such absurdities in the magazines and even in the exhibitions. Before printing a cloud negative into any view the worker should always ask himself whether those particular clouds are properly appropriate to the scene, or whether they lend expression to the scene. If not, they should not be used. The general rule is that the clouds must either appear to have been taken at the same time as the rest of the picture, or, at all events, be in keeping with the general sentiment expressed in the picture. If this rule were kept in mind we would see fewer sunset pictures with cross-shadows in the foreground, impositions which impose upon no one but their makers.



Port. 2½ x 4½

WINTER EVENING

Osborne I. Yellott

Philadelphia Salon, 1899

Pla:. 3¼ x 7¼

J. H. McCorkle

The exposure for clouds to be used for printing-in differs in nothing from that required for other cloud negatives. Any backed plate can be used, but as before, the most satisfactory results are obtained by the use of color sensitive plates. With the exceptions noted, a very light colored screen may be used with advantage in this class of work, the result being to preserve the delicacy of the clouds better than where a darker screen is used. But the screen adapted for landscape work generally can be used for obtaining clouds for printing-in purposes only, provided a sufficient exposure is given.

Where the entire plate is to be used for the clouds it does no harm to tilt the camera a little. This method is in fact preferable to raising the camera front, since the tendency of the filter or color-screen, as has been stated, is to reduce the field of the lens' illumination, thereby cutting off the corners; hence the plate should remain in the center of illumination whenever possible.

Cloud negatives, to be used for printing-in, should be just as thin as they can possibly be made — mere ghosts of negatives. It is the non-observance of this rule that makes the printing-in method so formidable. To secure this result development should be stopped just as soon as the clouds have begun to acquire the slightest density and while the sky itself is almost white in the plate. This gives a negative which is practically transparent, and can be printed on platinotype paper in five or six seconds. Being so transparent, the negative can be easily adjusted over the foreground print, and the difficulty of registering the two printings is thus reduced to a minimum. The clouds should have just enough density to "stand up" under the printing light for the five or six seconds required to print the sky to the proper depth, and yet be thin enough to print in all their gradations. In addition to these very material advantages, by invariably developing cloud negatives in this way it becomes unnecessary to examine the sky from time to time in printing to judge as to its proper depth, a difficult feat at best in platinotype printing. If five seconds exposure to sunlight is found sufficient with one negative it will be sufficient for all, and the printing of cloud negatives thus becomes a matter of counting instead of repeated examination.

In printing-in clouds the temptation is always toward spectacular effects. While the sky is one of the most important features of the landscape, it should nearly always be represented as subordinate to the landscape proper. For this reason clouds should seldom be printed to their full value when used with a foreground. In the picture, "Ebb Tide," for instance, the cloud negative is much more beautiful than I have allowed it to appear in the print. A soft glow of light seemed to be much more appropriate to the sentiment of the picture than would a sky full of the delicate traceries of clouds at sunset. In "The Beginning of a New Day" the case was different. The sky contained the entire sentiment of the picture and there was every reason for giving it its full value. It is impossible, in the limited range of tone obtainable in photographic printing processes, to give the deep blue of the summer sky its full relative value to the trees in the foreground. Here we must compromise, always keeping it at least a shade lighter in tone than the trees, grass, etc.

The aim should be to produce the impression that the clouds were in the view, not that they were printed in. They should also appear to belong to the view, and this is never the case where they are printed so forcibly as to attract attention at the expense of all else. For this reason also, one cloud negative should never be used with more than one particular foreground. Especially should not the cloud negative be used with half a dozen or more foregrounds as some use them. Cloud and foreground negatives should be made with the same developer wherever possible, especially when they are to be printed on printing-out paper. It is well known a pyro-developed negative gives a print on *Solio* or *Albuma* entirely different in color from one developed with metol. The difference obtains with other developers in a slighter degree, but is often considerable.

The Method of Printing-in. The operation of printing-in clouds in a landscape is not at all difficult after a few well directed attempts. Directions, however, are necessarily complicated and make very difficult reading unless followed closely. Before beginning we must understand the end proposed in what we are about to do.

In the first place we are to make a print of a foreground or landscape with a perfectly blank sky. I assume that we have a foreground negative which has a perfectly opaque sky, and which will therefore print with a perfectly white sky-space. Later we will learn how to fix our negatives if they are not suitable in this respect.

Assuming then, that we have a print from our foreground negative and that it has a blank white sky-space, we propose to print a suitable sky into this space from one of our cloud negatives. If we put the foreground print over the cloud negative and print it in that way we will find our foreground as full of clouds as our sky. We must therefore mask the foreground portion of the print in some way while the sky is printing. If we follow our first inclinations we will get a fine pointed knife and cut a mask very carefully just to fit our foreground print, put it over the foreground as carefully as we possibly can, put that on the cloud negative and put it out to print. When we take it in we will find that the sky has printed down to the mask and there stopped, and that there are at least sixteen different points where the mask didn't fit, all evidenced by spots or lines of white or black, as the case may be. This is failure.

But, if instead of going about our double printing in this way, we cut a mask roughly to the sky-line of the foreground print, adjust the latter over the cloud negative and then vignette the sky boldly into the foreground portion of the print, we will find that we have something nearer the right thing. The sky may come down over our horizon a little, but it is barely noticeable. If we have printed our sky somewhat too heavily we will find an unnatural band of light right above the horizon where we have vignetted our sky in the print. This, however, is a first attempt and we may reasonably hope to do better in the future, something we could not look for by following the first method.

Other "Wrinkles:" Masking.

There are yet many little wrinkles about cloud printing which may be useful to know, and these I will endeavor to explain. The first wrinkle is in using thin cloud negatives. This has already been explained. In the second place there is a best way of making our mask for vignetting, and then there is always the danger of spoiling our foreground print while printing the sky. To make sure of the former, and avoid the latter, make a proof of the foreground negative on printing-out paper the exact size of the foreground print. Now cut a sheet of black paper the exact size of this proof. Place them together and with a pair of shears cut roughly along the sky-line of the proof, cutting through both at once. Don't try to follow every little tree or twig, but do it roughly, following the lines of buildings or other light objects closely, but nothing else. Either black paper or proof will give us our mask for vignetting and the other will give us a mask to absolutely protect our foreground.

This latter mask, in the case of an ordinary landscape, such as the picture, "Departed Day," is to be placed over the foreground print so that its upper edge comes about a quarter of an inch below the sky-line of the print. But in a more difficult case, such as the fish-house in "Ebb Tide," or in the horizon in "The Beginning of a New Day," it must fit more accurately. In these latter cases there are nine chances out of ten that the mask will slip in placing it and the print on the cloud negative. To avoid this cut some little squares from a thin visiting card, say about a half inch in size. Cut two or three slits partly through each of these and use them like paper-fasteners to hold the mask over the print. But first in the case of a print like "Ebb Tide," where only a portion of it need be closely masked, cut away about a quarter of an inch along the upper edge of the mask except where accurate registering is needed. Thus we avoid harsh lines.

Printing Frames. Unless the sky and foreground negatives exactly suit each other, which is not often the case, it will be found that the foreground print is going to lap over the cloud negative after being properly registered. This calls for a printing frame at least a size larger than the cloud negative, and this frame must be furnished with a piece of plate glass. A thin piece of glass will break under the uneven pressure of the smaller negative. To avoid this and also danger to the cloud negative the large printing frame should have weak springs. To make them weak, take the springs off and bend them backward over the edge of a table until the tension of the spring is sufficiently weakened for our requirements

Printing. We are now ready for the printing. The mask over the foreground print will indicate the lower edge of the latter, and by placing the vignetting mask directly over it we can locate the horizon if the cloud negative happens to be too dense to see through. With this guide, proceed to print from the cloud negative, moving the mask holder from a point an inch or so above the sky-line to a short distance below it. Vignetting in this way avoids the streak of light along the horizon, and enables us to vignette right into the foreground without much danger of spoiling it. The sky is naturally darker at the zenith than at the horizon. but the transition is very gradual. This method of vignetting softens the sky from the top of the print down to the horizon, and if carefully done yields perfect results.

The method just described is for printing clouds in on printing-out or platinotype papers, where the impression is visible to the eye and printing can be stopped at the right moment. For printing in our lantern slides by contact, on carbon or any of the development papers where the image is not visible the same method will suffice as far as it goes. The only additional difficulty is in registering the mask and gauging the exposures. The latter is a matter of experiment and much of it. The mask, however, can be easily registered by making a proof on printing-out paper which has been cut to the exact size of the negative, the printing paper or tissue being cut likewise. The foreground print is made after carefully registering the paper on the negative, this being easily done by pressing both closely into one corner of the printing frame. The proof having been likewise carefully registered in printing, and after being cut out as before, can now be accurately registered over the exposed but undeveloped image of the foreground on the printing paper.

Methods of printing clouds in lantern slides by reduction were treated in THE PHOTO-MINIATURE, NO. 9, *Lantern-Slides*, and by the carbon method on page 218 in No. 17, *The Carbon Process*.

Copied Negatives. In very difficult cases of cloud printing, and especially where a large number of prints are to be made from the same negatives, it will be found far easier to make a perfect print on printing-out paper, tone it and then copy it, making a new negative from which any number of prints can be made. An alternative method is to make one positive from the foreground negative and another from the cloud negative, vignetting the lower portion of the latter much as in making a print. Place the two together in their proper relative positions, locally reducing the sky position where it encroaches upon the foreground, and then bind them together with lantern-slide binding. Now place them in the reducing or enlarging camera, and make a copy negative of any desired size, this serving, as before, for any number of prints.

In the method of printing-in above set forth, I have spoken of printing the clouds into the landscape. This was done in order to make the directions more easily understood. In many cases that method will serve as well as any other. But there are other cases where the clouds should be printed first and the landscape afterward. In "Departed Day," for instance, the sky was printed first and the foreground put in on top of it as it were. This renders the trees in better relief than the reverse method and also serves to conceal better the vignetting of the sky into the distance.

In printing the reflections of clouds in water, reverse the negative, printing through it and, of course, upside down. Also print, as a rule, somewhat darker than the sky itself. The slight diffusion caused by printing through the negative will be found wholly true to nature. In fact, it is a common thing to reverse negatives in printing clouds into the sky-space, this being done wherever they would appear to be lighted from the wrong side if printed in the ordinary way.

Defective Skies. It will frequently be found that the negative from which the foreground is to be printed has a sky which will print to a greater or less extent unless something is done to prevent it so doing. A simple method, where it is possible, is to use the upper half of the *Solio* proof and mask the sky in printing the foreground. It is used in the same manner and on the same principle as the foreground mask, except that the second or inside mask is not often necessary.

A second method is to block out the defective sky with opaque paper as far down as possible and from that point down to the horizon with India ink or opaque color of some kind applied carefully with a fine brush. It is hardly necessary to say that all scratches or pin-holes in the sky should be carefully spotted out before printing. A third method is by local uranium intensification as set forth on another page.

A favorite method is to block out the skies in development where the sky in the negative is not suitable and cloud printing is foreseen. Development is carried along in a fairly dilute solution as usual, and when the image is well up strong developer is applied locally to the sky. In both "Ebb Tide" and "Departed Day" the skies were prepared in this way. In the latter there was simply a clean sweep of strong developer right across the sky, trees and all. In the former, however, the sky space was carefully prepared for the reception of the clouds. The local development itself was vignetted off to the corners of the sky-space, the centre of that space being left perfectly dense. This course left a pure white space in the centre of the sky-space, while the corners printed as though sunned down in printing. The sky was next printed in, the result of the whole being a concentration of interest where it was desired.

Improving Negatives. It frequently happens, no matter how much or how little care has been used in making a negative containing clouds and foreground on the one plate, that the two portions do not print up in quite their proper relation. This may be corrected frequently by dodging in printing, that is by masking the thinner portion of the negative and giving the other a chance to catch up. But this is always troublesome and must be done with every print. If the trouble is properly corrected in the negative it is done once for all.

There are several methods of accomplishing this end, a perfectly automatic one being by reduction with ammonium persulphate. This reducer acts on the high-lights of the negative first, and its action should be stopped as soon as the proper relations of sky or foreground are obtained. It is preferably used in a 3 or 5 per cent solution, its action being arrested by immersing the negative in a 10 per cent solution of sodium sulphite, after which the plate is well washed.

Another method is to reduce the sky locally by the use of potassium ferricyanide. First soak the negative in a 1 : 15 solution of hypo. Then go over the sky carefully with a tuft of cotton or brush soaked in a very weak solution of potassium ferricyanide, say five grains to two ounces of water. Wash the plate thoroughly as soon as the proper amount of reduction is secured.

A third method is to locally intensify the foreground portion of the negative if this is too weak. The Agfa one-solution intensifier applied with a brush or tuft of cotton is excellent for this purpose.

Another method of local intensification, which is probably the best of all these means to the one end, is to intensify the negative with uranium. Make up solutions as follows: *A*. Uranium nitrate, 1 ounce; water, 5½ ounces. *B*. Potassium ferricyanide, 1 ounce; water, 5½ ounces. For use take: Water 6 ounces. *B*. Two drams; glacial acetic acid, 1 dram. *A*. Two drams. Immerse the negative in this and rock gently. It will soon become of a brownish tone, if left long enough it will become a decided red. Before this stage is reached, however, remove and wash the plate. Swab the film gently with a tuft of cotton. Now make up a 10 per cent solution of carbonate of soda in water. With this and a brush go carefully over the sky portion of the negative. It will be seen to immediately discharge the color, leaving a stain over those portions of the negative which require intensification. The first test will probably result in over intensification. If so, remove all the stain with the soda solution, and after thoroughly washing the negative, start over again, immersing it this time for a shorter period in the uranium bath. Uranium intensifies not only by adding density but as well by altering the color of the negative, replacing the black by a non-actinic brown. Hence it is one of the best of intensifiers. A somewhat similar method is to stain the part of the negative needing intensification with a yellow or red aniline dye.

Here the story ends. Beyond the points mentioned there are innumerable modifications and dodges which will reveal themselves to the worker as he puts into practice the things already treated of in the foregoing pages. I have confined myself to methods which have proved satisfactory in actual work, rather than attempted to include methods of questionable usefulness or impractical theories. If what is here given will make the mysteries of cloud photography clear to the individual reader my purpose has been fulfilled.

Acknowledgment. Grateful acknowledgment must be made to Messrs. Carpenter, Luitwieler and McCorkle, whose pictures of cloud forms, with those sent by Mr. Yellott, round out the text in a most acceptable way.

BOOKS.

There are no books devoted especially to cloud photography, but in all the works mentioned below will be found chapters offering practical help to students of this interesting application of photography.

Practical Pictorial Photography. By A. Horsley Hinton. In two parts. Illustrated. 1898. (English.) 50 cents each part.

Pictorial Effect in Photography. By H. P. Robinson. $1.50.

The Elements of a Pictorial Photograph. By H. P. Robinson. 167 pp. (English.) 1896. $1.75. This contains an illustrated chapter on "The Sky" and is, perhaps, more useful than "Pictorial Effect."

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NOTES.

We record, with keen sorrow, the death of Mr. H. P. Robinson, which took place February 21, at Tunbridge Wells, England, his home for many years past.

To the younger generation of American photographers H. P. Robinson was known chiefly by tradition, or by his writings on pictorial photography. Nevertheless, it may be said with truth that, for over a quarter of a century, his influence upon the development of pictorial photography in America was greater and more direct than that of any other worker.

Mr. Robinson entered upon photography in the early fifties, and almost immediately began to publish the composition pictures which first gave him fame. These "composition" pictures—in which many negatives were combined in one print to tell a story—were followed by a series of equally clever compositions best described as "Landscapes with Figures," of which the well-known "Carolling" and "Wayside Gossip" will readily be recalled. About this time Edward L. Wilson began, in Philadelphia, the publication of his magazine *The Philadelphia Photographer*, in whose pages the works of Robinson were first published for American photographers. A warm friendship sprang up between Robinson and Wilson, as enthusiasts in the pictorial possibilities of photography. Mr. Wilson was the recognized leader of the American fraternity and, as quickly as they appeared, Mr. Robinson's pictures and books were broadly published for the guidance of American photographers. Thus the circulation and influence of Robinson's "Pictorial Effect in Photography" were as wide on this side of the Atlantic as in England. His "Studio, and What to Do in It" had an almost equal vogue, and there is a steady demand for Robinson's books even today.

The following estimate of his life and work from the *British Journal of Photography* is an interesting summary:

A member of the Council of the Photographic Society nearly thirty years ago, he subsequently became one of its vice-presidents. Last year he was elected an Honor-

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ary Fellow of the society. In 1896 he was president of the Leeds Meeting of the Photographic Convention of the United Kingdom. The extinct Solar Club; the Field Club; and the Camera Club also are a few of the many other societies to which he belonged at various times. The medal of the Photographic Society fell to him on many occasions, and in 1878 one of his photographs at the Paris Exhibition secured the International Gold Medal. At a period when photographic exhibitions were less frequent than they are now, Robinson's success was of constant occurrence, and between 1860 and 1890, he was probably the recipient of about 100 medals. Judged from the standpoint of the competing photographer, Robinson must be allowed to have left himself no more worlds to conquer. In his profession, as an author and as an exhibitor, success and popularity rewarded his efforts, and his reputation was world-wide.

Robinson's exact place in the history of that branch of photographic work with which he was identified has yet to be assigned by a competent authority, and his influence on contemporary and succeeding work correctly estimated. This is a task perhaps best remitted to the future, which may be trusted to yield both the opportunity and the man. Looking back over the gulf of years, the shadowy but notable personalities of D. O. Hill, O. G. Rejlander, Julia Margaret Cameron, now joined by that of H. P. Robinson, stand out for recognition; but what existing influences pictorial photography in 1901 owes to each of them who shall say? The last link between the old order of things is snapped by the death of H. P. Robinson, whose disappearance we are sure will be regretted by photographers all the world over, and by none more sincerely than the writer of this brief notice.

◆

The Allison Cup, presented to the Photographic Society of Philadelphia, by J. Wesley Allison, to be offered yearly as a stimulus towards the photographic illustration of particular themes, has been awarded, for the first time, to S. Hudson Chapman. The series of pictures submitted by Mr. Chapman illustrate "The Parable of the Sower," and the work is spoken of as of high quality.

◆

The Photogram for March opens with an interesting paper on "Photographing Fire," the first contribution to this subject within our knowledge. "The American

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School" is described, with illustrations, by "An Onlooker"; and F. Holland Day's "The Seven Words" (of Christ) forms the frontispiece of the issue. [Spon & Chamberlain, New York. 15 cents.]

◆

The official report of the Third Photographic Salon, Philadelphia, 1900, appears in the Journal of the Photographic Society of Philadelphia for February, just published. The subjoined extract from the report is of public interest:

The usual preliminary notice was issued March 1, 1900, announcing the date of the exhibition as from October 21 to November 18. Full circular, with entry form, etc., was issued May 1.

There were 883 pictures submitted to the Jury, representing 168 entries. These entries came from 53 cities or towns—47 American (in 16 states) and 6 foreign.

From the pictures submitted the Jury selected for exhibition 118, representing 53 entries.

Four foreign entries (for submission to Jury) included 10 pictures, none of which were accepted.

Ninety-three American entries (outside of Philadelphia) represented 519 pictures, of which 83 were accepted from 33 exhibitors, or a percentage of 16.18.

Thirty-three entries from members of the Photographic Society represented 193 pictures, of which 27 were accepted from 14 exhibitors, or a percentage of 13.99.

Thirty-eight entries from Philadelphia, outside of the Society, representing 161 pictures, of which 8 were accepted (from 6 exhibitors), or a percentage of 4.97.

The general percentage of accepted pictures from all sources was 13.36.

A "private view" was held on Saturday evening, October 20, attended by about 800 persons, many being from other cities. The total attendance during the period of the exhibition was 15,600, admission being free, as heretofore.

Fifteen pictures were sold during the exhibition at a total price of $193, the average price being $12.87 each, The average selling price in 1899 was $11.95, and in 1898, $8.04.

While in the main your Committee feel that the third Salon has been a notable success, they are not unaware of its many imperfections. Plans to attain certain results are easily made, but not so readily carried out. Modifications and compromises must be made as preparations progress. Fair-minded criticism in the best interests of

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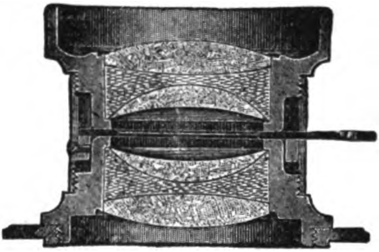

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artistic photography and in line with the purposes of the Salon have always been welcomed, and details have been altered each year as experience has shown desirable.

In conclusion, your Committee wish to express their appreciation of the support received from many members of the Society in their efforts towards the success of the Salon, and to congratulate the Society on the interest shown in this as one of many applications and phases of photography to which its fostering care is given.

ROBERT S. REDFIELD,
JOHN G. BULLOCK,
EDMUND STIRLING.

❧

Gut Licht is the name of a practical year-book of pocket size published by Hoffmann, Dresden, Germany, at 1 mark 50. It contains a fairly comprehensive review of the progress of photography and a few attractive illustrations. Dr. Hermann Schnauss, the editor of *Gut Licht* and the German periodical *Apollo*, tells us that THE PHOTO-MINIATURE is very much appreciated among German photographers, who know it by translations appearing in *Apollo*.

❧

The Weekly Press, published at Christchurch, New Zealand, continues to work wonders in the direction of special issues. The number last received is largely devoted to the description and illustration of the inauguration of the Australian Commonwealth. The half-tones are very numerous and excellent in quality, giving with the text a capital account of the brilliant ceremonies attending the event.

Among the "Book Notices" we find an appreciative mention of THE PHOTO-MINIATURE, for which we believe we have to thank Mr. Walter Burke, F. R. P. S., a subscriber to the magazine, and one of the best known of New Zealand photographers. Mr. Burke is a member of *The Weekly Press* editorial staff, and is responsible for much of the paper's pictorial attractiveness. We heartily congratulate all concerned upon the success which attends their work.

❧

A series of illustrated papers on "Bird Photography," by the Rev. P. B. Peabody, is being published in *Western Camera Notes*, Minneapolis, Minn. This sprightly little journal has much improved in its second volume, and

TWO POINTS

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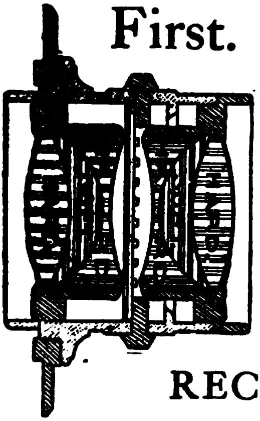

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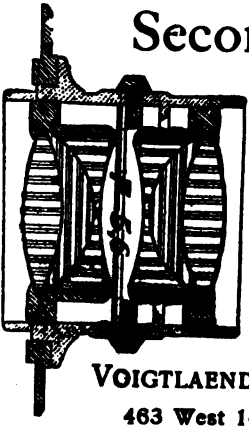

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must now be considered among the more serious photographic magazines.

* * *

Ready-prepared paper for gum-bichromate printing has been placed on the market by A. W. Scott, 1655 Broadway, New York. In London, Hochheimer's gum-bichromate paper may be obtained from J. R. Gotz, 215 Shaftesbury avenue, W. C.

The comments of readers who have read THE PHOTO-MINIATURE, NO. 22, describing *Gum-Bichromate Printing*, are interesting. Thus far the verdict is decidedly encouraging. Mr. Waugh seems to have made the subject attractive. One man, however, protests that the enthusiasm concerning the process shows that many amateurs are training for lunatic asylums.

* * *

A very practical hand-camera for outdoor work has just been placed on the British market. The special feature of this camera, which folds up into one and one-third inches in thickness and weighs only eight ounces, is a focal-plane shutter which permits of the highest speed or time exposures. The camera is extended ready for use by a simple arrangement of levers, and focusing is done by means of a movable jacket on the lens. The instrument has a finder, focusing screen and three double plate-holders; it carries a *Busch Aplanat* working at *f*/6, and is adapted for the Wallis system of daylight changing (plates). The camera sells, in London, for $33, or fitted with a *Beck Steinheil* anastigmat at $52. We know of no instrument to compare with this in America at twice the price.

* * *

Photographs in Bronze.—Dr. A. Miethe describes in *Das Atelier* a process which gives positives in bronze powder by the dusting-on method. These peculiar pictures are familiar to travelers who have visited Japan, and we have had occasional enquiries as to their production. We have not tried Dr. Miethe's method, so give it for what it is worth.

A plate of black or colorless glass is best for the support of the image. The Japanese use a black, highly varnished and polished piece of wood of a kind which cannot be obtained here. The process is similar to the ordinary dusting-on process, except that a very fine bronze powder is used. The fineness of the powder is most important; too coarse a grain leads to hard images; the finer the powder the softer and richer in half-tone are

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The choice of a developing agent presents no practical difficulty. There are many excellent developers, and choice is a matter of individual preference. THE QUALITY OF THE ALKALIES used is *the important point.* Upon their purity and quality depends the quality of the results secured with any developer. You cannot buy your alkalies with too much care.

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the pictures produced. Aluminium bronze gives the best results. The glass plate is cleaned first with nitric acid, then with water, and finally polished with chalk and wood alcohol and coated with a solution containing: White sugar, 154 grs. (10 gms.); pure dextrin, 154 grs. (10 gms.); water, 6 oz. (180 cc.'s.) After dissolving by the aid of heat, 1 oz. (30 cc.'s.) of 10 per cent solution of potassium bichromate is added. A little glycerine is also added, from 10 to 30 drops, according to the dryness of the atmosphere. This helps the details in the shadows and quickens development. After coating, dry the plates at 60° C. on an iron plate in a dimly lighted room, and, whilst still warm, expose under a negative for some ninety seconds in the sun or eight or ten minutes in the shade. After exposure bronze powder is dusted over the plate (in the dark-room) with a soft camel's-hair pencil. If the image which appears is feeble, the plate was exposed too long, or too little glycerine was added. If the image appears at once with all details or fogs all over, exposure has been too short or the glycerine in excess. With correct exposure, etc., the image should appear in about ten minutes with three or four dustings. As soon as developed, dust off the powder and bring the plate into daylight for a short time. It is not absolutely necessary to treat the plate further beyond varnishing it with a thin shellac varnish, but some prefer to coat first with a 10 per cent collodion and then wash out the unaltered chromate. If a colorless glass plate has been used, the back is, of course, coated with black asphalt varnish. The process is extremely inexpensive, and the results highly decorative.

◆

Messrs. Ross Ltd., 111 New Bond St., London, are preparing a new illustrated catalogue of their lenses and photographic appliances. Copies may be had on application to Messrs. Ross and we are asked to remind American correspondents that the letter rate to England is 5 cents per half-ounce.

◆

A catalogue of the recent exhibition held by the Akron (O.) Camera Club has reached our table. The catalogue lists 205 prints by 33 exhibitors, several of the prints being reproduced as embellishments. With three exceptions the exhibits were wholly the work of Ohio amateurs and professionals, among whom we note several of national reputation. A mounted platinotype, evidently copied

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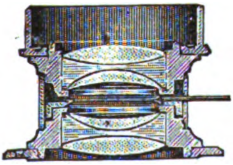

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from a painting, but without explanation or title, forms a supplement to the catalogue.

◆

Edward W. Newcomb contributes to the March issue of *The Professional Photographer* (Buffalo, N. Y.) a stirring protest against photographic lies and deceptions. The paper is couched in forcible language, but deals with an evil which sadly needs correction.

◆

Minott M. Govan, dealer in photographic supplies, long established in Clinton Place, has opened a new store at 6 West 16th Street, New York. Mr. Govan proposes to make a specialty of high-class amateur supplies, and his varied experience of the market should enable him to offer a satisfactory service.

◆

Mr. Chapman Jones, an authority on negative making, is up in arms against the use of acid fixing baths, as destructive of the permanency of negatives. So another cherished improvement goes by the board! He says: "Acid fixing baths should be absolutely eschewed. The very grave risk that accompanies their use is not appreciated, or they would never be recommended. The effect of acids on stains due to oxidized developers is to lighten the color of the staining matter and to render it insoluble. The action of alkalies is to darken its color and to render it soluble." As far as our own experience goes it does not bear out Mr. Jones' argument. Most of our negatives of the past ten years have been fixed in Carbutt's or Millen's acid fixing baths and, to all appearances, they are as they were ten years ago. We can see no evidence of fading or change of color, although not more than half of the collection were varnished.

◆

The demand for that new *Book List* of ours evidences a larger reading public than we anticipated. Over three thousand copies have been asked for in the past month—which also proves that THE PHOTO-MINIATURE is a satisfactory medium for advertising.

◆

We are threatened by a visitation of the photographic postal card craze prevalent in Europe for the past two years. The Rotograph people (B. Russegger, 7 West 14th St., New York) are introducing an attractive line of

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METOL The quickest and most energetic of developer
Oz., 75c.; lb., $10

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HAUFF

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Trade Agent
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sensitized postal cards in two varieties, i.e., on matt and glossy paper. These sensitized cards are very convenient for many purposes, but especially as affording ready opportunity to send local views or an occasional portrait to distant friends. It will be interesting to see whether the busy American takes to the idea.

❧

The Photographers' Association of America will meet at Detroit, Mich., August 6th to 9th, inclusive, under the leadership of President E. B. Core, of New York. The convention is this year to be an educational affair, and in the exhibition department the radical change has been made of abolishing all prizes or awards. These two features alone should make the affair distinctly more useful to amateur photographers than any previous convention, and we suggest that those who can should arrange to spend a day or two in Detroit during convention week. The secretary of the association, Mr. J. George Nussbaumer, of Buffalo, N. Y., will gladly supply information as to hotels, railroad rates, etc., on request.

❧

During the early summer months of 1900, Miss Mary M. Vaux, with her brothers, George and William S. Vaux, Jr., all members of the Photographic Society of Philadelphia, made a photographic trip through the Canadian Rockies and British Columbia. The pictorial results of their holiday, comprising about 150 prints, form an extremely interesting exhibition at the rooms of the Philadelphia society this month. Apart from every other point of view, the collection offers a most convincing demonstration of the pleasure afforded by amateur photography to the traveler with a camera, and afterwards, to those who are obliged to stay at home, who find enjoyment in these glimpses of what the travelers saw during their journeyings.

❧

By an unaccountable blunder the notice of the *San Francisco Photographic Salon*, written for our February issue, failed to appear in print. The world lost nothing thereby, but the publication of the note would at least have marked our interest in the Salon. The affair has been so fully described and so well illustrated in our contemporary *Camera Craft* that it would be superfluous to take the event up at this late day. THE PHOTO-MINIATURE, however, records its great pleasure in the remarkable success which attended the Salon, and rejoiced especially

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to see how thoroughly Western it was in exhibitors and exhibits. The reproductions in the dainty *Salon Catalogue* sent to our desk by the editors of *Camera Craft*, show that good photography was well represented at the exhibition, the craze for "pictorial photography" *in excelsis* having apparently failed to permeate the great West as yet.

◆

By an equally unaccountable blunder we neglected in our last number to acknowledge our indebtedness to Mr. A. G. Fox, who supplied the sketches from which the diagrams in *Photographic Manipulations* were made. Mr. Fox will please accept our sincere apologies and thanks.

◆

Imaginary Answers to Imaginary Correspondents.—Written upon approved models found in our British exchanges.

H. McB. J. We have heard the rumor of your "tired feeling." Better take a rest. Don't write any more for a full year. Consult "Power Through Repose," by E. P. Call (Century Company, N. Y.)

E. W. N., B. J., Dr. L. H. and others. See answer to H. McB. J.

"Spring poet." Thanks; we don't publish poems. Try *Photo-Era*, Boston.

◆

The editorial offices of *The Photogram, Ltd.*, have been removed from 6 Farringdon Ave., E. C., London, to a spacious suite of rooms at Effingham House. Arundel street, Strand. Messrs. Dawbarn & Ward, Ltd., who shared the premises at 6 Farringdon Ave., with *The Photogram, Ltd.*, now occupy the entire floor, an enlargement made necessary by growth of business.

◆

Mr. R. D. Gray, Ridgewood, N. J., has patented a triple condenser for lantern projection and enlarging purposes, which gives about three times as much light as the regular double condenser in general use. This improvement is so decided in character that the Gray Triple Condenser will doubtless supersede the older form.

◆

The sixth annual convention of the Photographers' Association of Kansas will be held at Junction City,

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Kansas, September 25 to 27. Secretary, E. K. Porter, Sterling, Kansas.

The first annual convention of the Photographers' Association of Kentucky and Tennessee will be held at Nashville, Tenn., April 16 to 18. Secretary, C. P. McLean, Henderson, Ky.

The Photographers' Association of Pennsylvania will meet in convention at Reading, Pa., April 29. Secretary, W. E. Buehler, Philadelphia.

* * *

The Photograph as an Illustration.—A "broadside" reprinted from the New York *Times* Saturday Review, March 2, 1901:

The growing conceit of the camerists who are talking about their work as art is more and more emphasizing their limitations. Art in a sense the skilful photographer must follow, if he cares to avoid the merely realistic and the bluntly natural, but his art is one of intention oftener than of accomplishment. He may have all of the feeling, the trained observation, and the wish for definite art expression that make the painter, but his machine is one that compels him to sacrifice his wishes to the inevitable, all-seeing eye of his lens. In manipulating his plate, using various developing agents, restrainers, brushes, etc., he can modify the hardness and detail of his original, and still more can he approximate his ideal in the printing. But when all is done, it is a photograph, evident to the merest tyro that uses a camera. In this modification, however, and in the selection and lighting of his subject, he may prove a distinctly artistic taste and feeling. Herein lies the charm of picture making with a camera. Nothing but a brush and a color box or a practical knowledge of drawing, though, can ever give such a man or woman satisfaction. There is no denying the great value of the photograph as a cultivator of the eye and a developer of any latent artistic feeling. The trying for a picture that shall suggest the motive with which the camerist approaches it is worth a great deal, and a persistent and studious photographer, who brings to his work intelligence and temperament, soon learns to better appreciate real art when he sees it.

In all but his means he is often entitled to consideration as an artist. It is in dealing with landscapes that the camera is most successfully employed. Here there is a chance to convey something of the impression of a particular scene, and even though the lens takes too much, there are ways for arriving at many charming

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Owing to the numerous complaints we have received from intending purchasers of our goods, to the effect that many dealers in photographic supplies throughout the country are unable to supply Rotograph Paper on account of certain trade restrictions, we beg to state that hereafter where parties cannot obtain our goods or an effort is made to substitute other brands, we will be pleased to fill orders direct at prices named in our Price-list of January 8, 1901, and *deliver goods free of charge* to the customers, irrespective of size of order or locality.

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effects. In dealing with matters of fact, the everyday happenings on the street, on the battlefield, on shipboard, etc., the camera is an inestimable aid in the noting of current history, and is appreciated here at its true worth. The attempts made now and then to illustrate fiction with photographs have never been very successful. Right here comes in the objectionable realism and lack of discrimination. One of the hardest problems the photographer has to solve is to get his human subjects to "look natural." In spite of subterfuge and what we may slangily call "jollying," humanity will appear self-conscious when being looked at. The fact that the operator looks the other way and the lens is but a bit of glass doesn't make any difference. The latter is an open eye that stares us out of countenance and makes us feel as if it were looking quite through our pet assumptions of dignity, repose, animation, or what not. It is just this that spoils the photographic illustration. No matter if the characters be professionals accustomed to appearing on the stage—they pose. The artist can compel his people to look natural and can give their faces the expressions appropriate to the scene. He gives us a composite of types, not any one individual. Now and then, when photographs are used to illustrate stories, and the camerist is clever enough to make them vague, leaving something to the imagination, they are not wholly without interest. It is in dealing with simple figures that the best results are obtained. When the photograph is one of action, groups of individuals doing something, it is rarely successful. The snap-shot arrests action and gives to moving figures the appearance of mechanical mannikins with the springs run down. Real people who fit stories are much rarer than a day in June.

◆

Historic Photographs.—An exhibition of unusual interest was given by Mr. W. I. Scandlin, editor of *Anthony's Photographic Bulletin*, before the N. Y. Genealogical and Biographical Society, on the evening of March 8. The exhibition comprised 45 photographic views of New York and Hudson river scenes, made 1851–57, almost 50 years ago.

The history of these photographs is worthy of record here. The original negatives are fine examples of the waxed paper negative method invented by LeGray, and introduced in America by Victor Prevost, the maker of the negatives in question. Next to the small

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collection of early negatives (1847), known as the Josiah P. Cooke collection, preserved in the Harvard Library, Cambridge, Mass., these negatives by Prevost form perhaps the most important collection in America, apart altogether from their value as rare records of scenes in and around New York in the fifties.

Victor Prevost was a teacher of drawing and painting, a professor of physics and photographer of no small repute who flourished in New York during the early fifties, dying about 1856 or 1857. Some of his paper negatives were as large as 18 x 22 inches, made with a Lerebour view lens of 4 inches focus, still in the possession of Mr. P. C. Duchochois, New York.

It is supposed that these negatives were originally part of a complete series covering New York and its neighborhood, but only forty-four remain, and some of these cannot be identified, so great is the change between the New York of 1852–4 and the city of today.

Among the negatives we can mention only a few, such as a view of Battery Place, Trinity and St. Paul's churches; exterior and interior views of Castle Garden (originally Castle Clinton), where Jenny Lind made her first appearance in America, under the auspices of P. T. Barnum, in 1850; a business house on Front street, negative signed and dated 1851; several views of Columbia College, then at the foot of Park Place, near Broadway, on the site of old King's College, built in 1774; a view of Grace Church about 1854, showing the wooden spire, replaced by the present spire in 1883–4, and a marble cutter's yard, on the corner now occupied by the Vienna Café, etc.

The exhibition of lantern slides from these old negatives, with Mr. Scandlin's description of the "find," and attempts to identify those without titles, was attended by a large and appreciative audience. After the exhibition many of those present remained to look over the prints from Prevost's negatives, and the meeting adjourned at a late hour.

Mr. Scandlin is to be congratulated upon his "find" of this valuable collection, which should find a permanent home with one of our historical societies.

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